



ARCADIS Orbic **ARCADIS Orbic 3D**

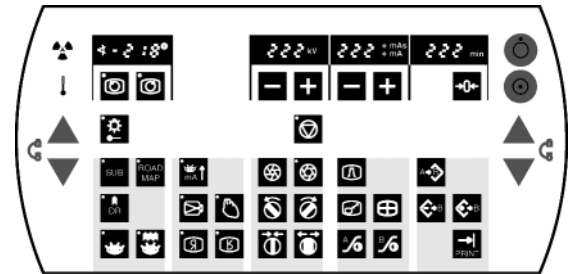
VB 13C

Quick Guide

syn^{go}
imaging

SIEMENS
medical

C-arm keyboard



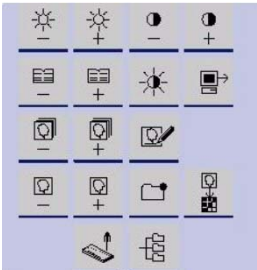
top/lateral row of keys


















	Radiation indicator		Tube unit temperature		System OFF		System ON
	Lift/lower C-arm		Lift/lower C-arm		Reduce/enlarge kV and mA		Reduce/enlarge kV and mA
	Rotate image		Rotate image		Reset fluoroscopy time		
	Single-tank laser light localizer		Switch dose stop function on/off				

bottom row of keys

	Operating modes: - Pulsed fluoroscopy - Continuous fluoroscopy		Operating modes: - Subtraction - Roadmap - Digital radiography
	Power Mode		Enlarge live image
	Noise reduction		Image reversal left/right or top/bottom
	Open/close iris diaphragm		Rotate slot diaphragm
	Open/close slot diaphragm		Edge enhancement
	Enlarge stored images		Monitor split horizontal/vertical
	Contrast adjustment left/right monitor		Save image
	Read images from memory forward/backward		Print image

Monitor trolley symbol keypad



	Brightness –		Brightness +
	Contrast –		Contrast +
	Scroll study back		Scroll study forward
	Scroll series back		Scroll series forward
	Scroll image back		Scroll image forward
	Switch between negative and positive image		Send to network node 1
	Enter a study comment		Mark image
	Copy to film sheet		Call up Patient Registration
	Select Patient Browser		



This product is provided with a CE marking in accordance with the regulations stated in Directive 93/42/EEC of June 14th, 1993 concerning medical devices. The CE marking applies only to medical devices which have been put on the market according to the above-mentioned EC Directive.

The original language of this document is German.

This Quick Guide is available in German, English, French, Italian and Spanish.

We welcome you as a user of the powerful ARCADIS Orbic/Orbic 3D C-arm system from Siemens.

This clearly laid out Quick Guide is intended to guide you through the operation of the system.



The Quick Guide is valid only in conjunction with the Operator Manuals and the safety information they contain:

- ☐ Please observe the Operator Manual and all supplements/addenda
- ☐ Please observe all safety information






The right-hand pages contain step-by-step instructions corresponding to the typical workflow in the OR.







The pages to the left contain illustrations and supplemental notes.

The description focuses on easy and fast operation of the ARCADIS Orbic/Orbic 3D from startup through to shutdown of the system including optional functions such as connection to a hospital network or subtraction.

More detailed and complete descriptions can be found in the ARCADIS Orbic/Orbic 3D Operator Manual.

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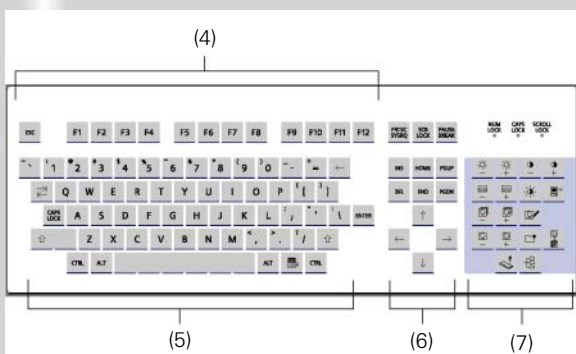
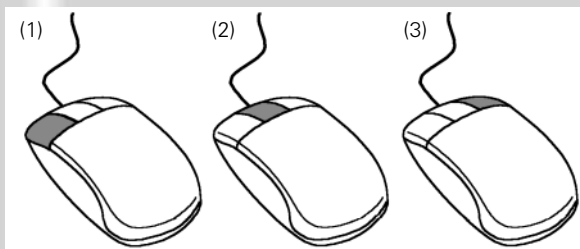
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Basics



This chapter is addressed to *syngo* beginners and users with little computer experience.



Functions of the symbol keypad see fold-out cover.

This chapter provides you with basic information on the input devices of the computer at the monitor trolley and on the *syngo* user interface.

Input devices

The mouse

- (1) Left button
 - Single click: select/mark
 - Double click: load data/program
 - Button kept pressed: drag/move
- (2) Middle button
 - Button kept pressed: windowing (change brightness and contrast)
- (3) Right button
 - Single click: call up popup menu (context-sensitive)

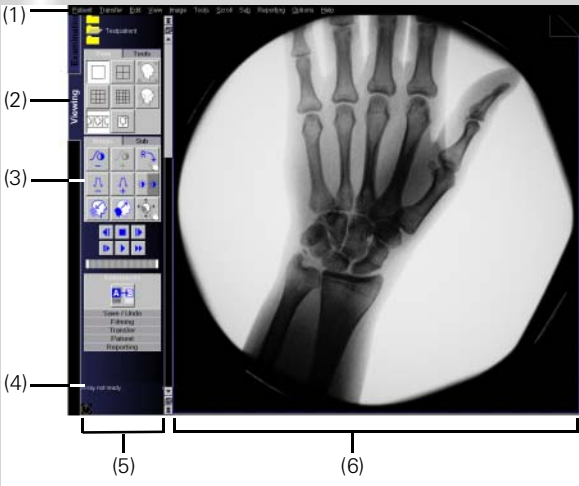
The keyboard

- (4) Function keys
 - F1 = *syngo* Online Help
- (5) Alphanumeric keypad
 - Text input, e.g. patient data
- (6) Cursor keypad
 - Movement of the mouse pointer in texts
- (7) Symbol keypad
 - Direct selection of important *syngo* functions (e.g. calling up Patient Registration or local database; image postprocessing functions)

Basics



After the ARCADIS Orbic/Orbic 3D system has been switched on, the *syngo* user interface automatically appears on the monitor trolley screens.



Patient Registration

PATIENT

Last name: _____
First name: _____
Middle name: _____
Title: _____
Other Patient Name(s): _____
Other Patient ID(s): _____
Patient ID: _____
Date of Birth: _____
Sex: ☐ Male ☐ Female ☐ Other
Age: _____ Years
Height (ft): _____
Weight (kg): _____
Additional info: _____
Details

PROCEDURE

Accession No: _____
Request ID: _____
Requested procedure(s): _____
Requested procedure(s): _____
Delete
Study: _____
Study comment: _____

HOSPITAL

Referring physician: _____
Requesting physician: _____
Admitting diagnosis: _____
Ward: _____
Admission ID: _____

INSTITUTION

Institution name: _____
1. Performing physician: _____
2. Performing physician: _____
1. Operator: _____
2. Operator: _____

Register Cancel Search Cancel Confirm Help

syngo user interface

syngo consists of several stacked task cards. These are assigned to the individual steps of the workflow.

Task cards

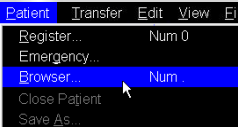
- (1) Menu bar
Calling up of main menus and submenus
- (2) Tabs
Selection/switching of task cards
- (3) Stack of subtask cards
Selection of processing tools and display functions
Switching of subtask card via tab
- (4) Status bar
Display of system messages
- (5) Control area
Display of image and examination parameters, selection of functions (via subtask cards)
- (6) Image area
Display and processing of images

Windows/Dialogs

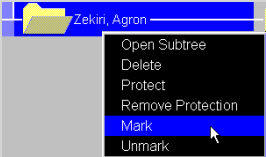
Windows are called up separately or displayed automatically.

Windows can be closed again after processing.

- (7) Title bar
Name of window, "Close window" button
- (8) Window content
Input and selection of data
- (9) Softkeys/buttons
Confirmation or cancellation of actions and messages



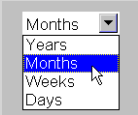
(1)



(2)



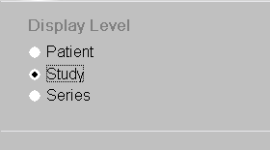
(3)



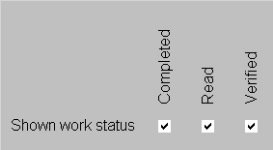
(4)



(5)



(6)



(7)



(8)



(9)



(10)

syngo control elements

Control elements on the screen are easiest selected with the mouse.

Menus

- (1) Main menu
Opens by pressing left mouse button
- (2) Popup menu
Opens by pressing right mouse button
The content depends on the mouse position ("mouse focus") on the screen

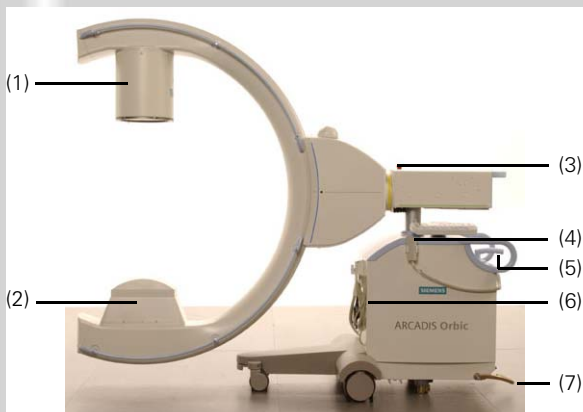
Input elements

- (3) Text input field
- (4) Selection list
Selection of preset parameters and data;
opens via arrow
- (5) Spin box
Setting of values with arrow keys
- (6) Radio buttons
Only one option selectable
- (7) Check box
Several options selectable

Icon buttons

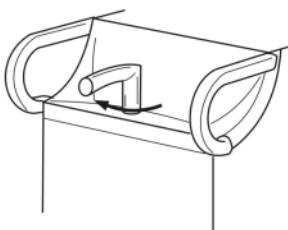
- (8) Dimmed
Function not selectable
- (9) Inactive
Function selectable, but not active
- (10) Active
Function activated

Product Overview

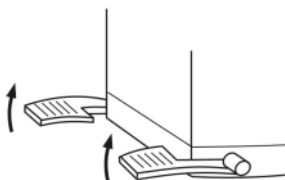


As soon as you press the emergency stop button, motorized up and down movement of the C-arm system is disabled.

(5)



(7)



C-arm system

C-arm

- (1) Image intensifier
- (2) X-ray tube
- (3) Emergency stop
- (4) Hand switch
- (5) Steering lever
- (6) Holder for footswitch
- (7) Locking brake

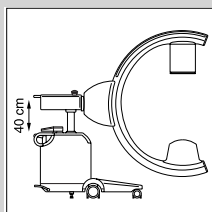
Steering lever, brakes

- (5) Steering lever
 - ❑ Steering lever straight:
Move C-arm system in any direction
 - ❑ Steering lever diagonal:
Move C-arm in transverse direction,
e.g. parallel to the table
- (7) Locking brake
 - ❑ Locking brake released:
Move C-arm system

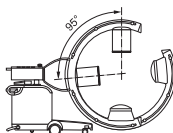
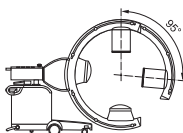
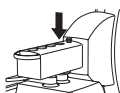
Product Overview



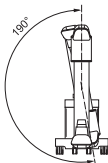
(1)



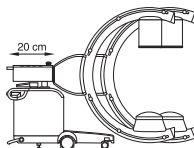
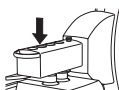
(2)



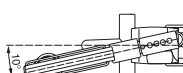
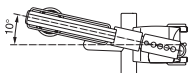
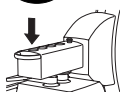
(3)



(4)



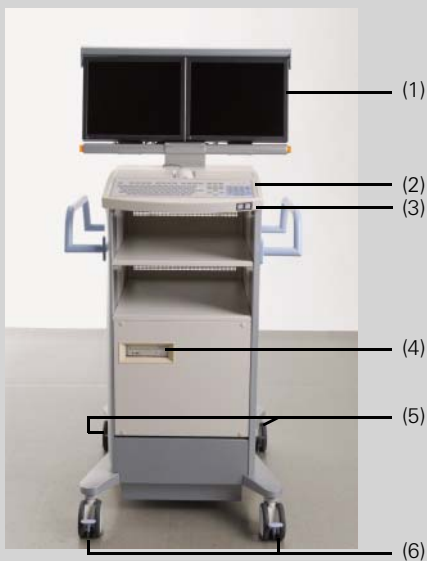
(5)



Moving the C-arm system

- (1) Vertical travel (motorized)
Lift and lower C-arm
up to 40 cm
- (2) Orbital movement
Change between a.p. and lateral position
 - Starting from the a.p. position, C-arm swivels by 95° in both directions, 190° in total.
- (3) Angulation
Rotate C-arm about support arm in vertical plane
by up to 190° in both directions
- (4) Horizontal travel
Move C-arm horizontally
up to 20 cm
 - Ideal for fine adjustments directly at the OR-table.
- (5) Swivel
Swivel C-arm about unit column in horizontal plane
by up to 10° in each direction
 - Ideal for fine adjustments directly at the OR-table.

Product Overview

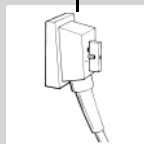
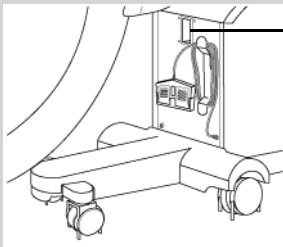


Description of keyboard see Basics chapter.

Monitor trolley

- (1) TFT flat screen monitors
- (2) Keyboard
- (3) Power on/off switch
- (4) CD drive
- (5) Direction locks on the back wheels
- (6) Brakes on the front wheels

Examination Procedure



(1)



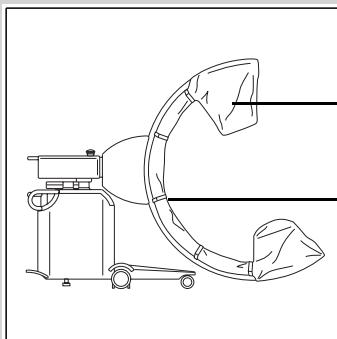
(2)



(3)



If an additional access control mechanism is configured for the system, you have to log in with your name and password.



(4)

(5)

Preparing the system

Connecting, switching on and booting

- ✧ Connect the monitor trolley connecting cable to the C-arm system (1).
- ✧ If available, connect the network cable (if the system is connected to an information system or a navigation system or network printer) (2).
- ✧ Plug the power plug into the power outlet.
- ✧ Switch on the C-arm system at the monitor trolley (3).
- ✧ The system boots.

Covering the C-arm with sterile covers

- ✧ If necessary, cover the C-arm, e.g. with the two-part sterile cover (4).
- ✧ Attach the cover with the sterilizable clamps (5).

Examination Procedure



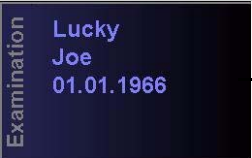
During operation, the window can be opened by pressing the **Patient Registration** icon button on the monitor trolley.



(1)

Exam

(2)



(3)

Patient registration

First, the **Patient Registration** window (1) appears directly.

(Here: maximal configuration)

- ✧ Enter the patient data into this mask (1).

At a minimum, the bold fields must be filled out.

- ✧ Using the mouse, click on the **Exam** (2) button.

- The patient data appear in the **Examination** task card (3).

- The unit is now ready to start an examination.

Alternatives

- ❑ Preregistration/Scheduler

The patient has already been registered in the Scheduler, from where it can be loaded into the **Patient Registration** card.

- ❑ Emergency

If the patient data are unknown, the patient is assigned a provisional number consisting of the date and the time of the entry. These data can later be corrected.

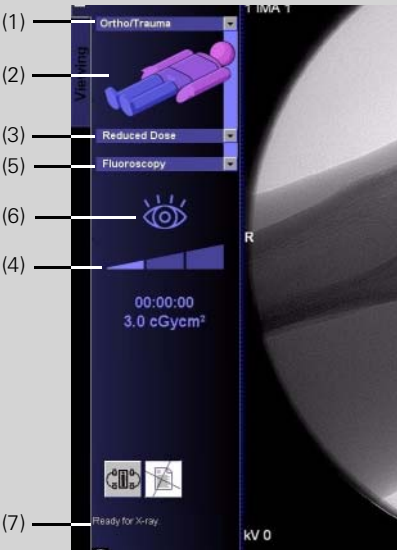
- ❑ Search

If an information network (e.g. hospital network) is connected, you can start a search for registered patients here.

Examination Procedure



To select parameters, use the mouse to click the monitor trolley.



If the optional laser light localizer is available, the object should be positioned with the laser light localizer, i.e. without radiation, as far as possible for reasons of radiation protection.



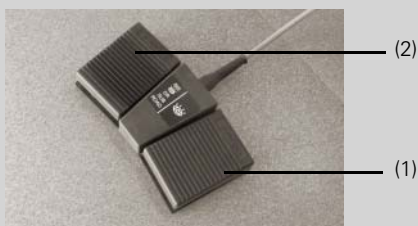
Preparation in the Examination task card

- ✧ Select the medical application area (1).
- ✧ Select the body region by clicking the VPA (Virtual Patient Anatomy) (2).
- ✧ Select the required application program (3).
- ✧ With the application program you simultaneously select a dose level (reduced, standard, increased). This is shown by a bar (4).
- ✧ Select the desired operating mode (5).
Alternative: Select/switch operating mode on the C-arm keyboard (see fold-out cover).
- ✧ The selected operating mode is shown as a symbol (6).
- ✧ The readiness of the C-arm is shown in the status bar (7).

Setting with the laser light localizer

Depending on the equipment, the I.I.-side or the I.I. integrated laser light localizer is available next to the tube-side laser light localizer.

- ✧ Laser localizer on the I.I. side:
Press the button on the laser light localizer to turn it on and off (8).
- ✧ Tube-side (9) and I.I.-integrated laser light localizer:
Press the button on the C-arm system (10) to turn on and off.



Exception: If the continuous fluoroscopy mode is set, pressing the left footswitch releases a single exposure.



Radiation release and dose display

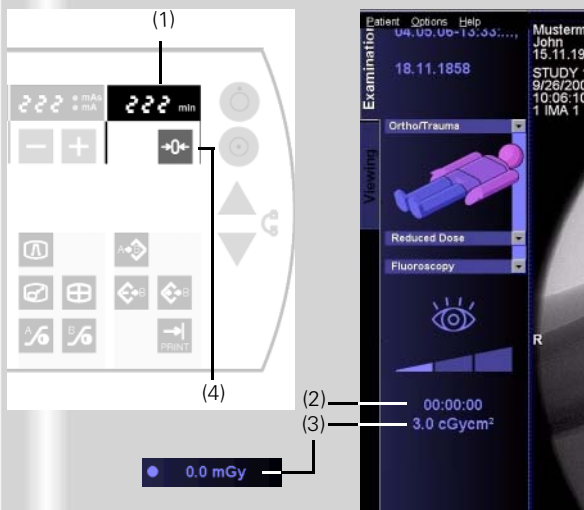
Radiation release with the footswitch

- ✧ Actuate the right footswitch to release continuous fluoroscopy (1).
- ✧ Actuate the left footswitch to release the set operating mode (2).

Radiation release with the hand switch

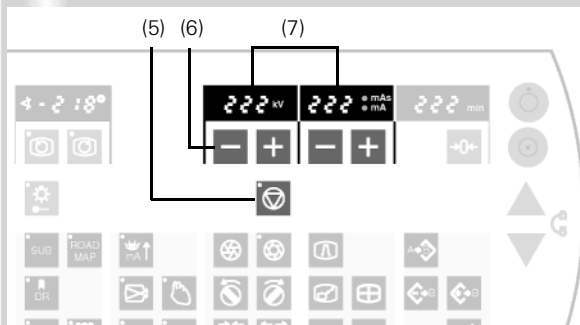
- ✧ Press the release button to release the set operating mode (3).

Examination Procedure



ADR stop is recommended, for example, for

- ❑ thin objects, e.g. wrist (the movement causes the object to slide out of the central beam, the image is underexposed),
- ❑ metal (high density of the metal leads to strong overexposure),
- ❑ transition between thoracic and lumbar spine (movement of the diaphragm/midriff causes changes in the exposure).



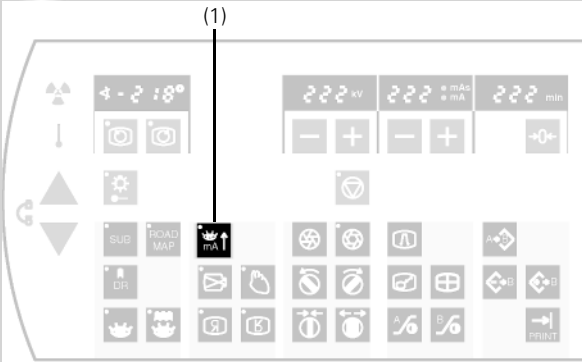
Radiation time and dose display

- (1) Display of accumulated fluoroscopic time at the C-arm system
 - (2) Display of accumulated fluoroscopic time at the monitor trolley (**Examination** task card)
 - (3) Display of accumulated dose at the monitor trolley (with optional dose measuring chamber)
Alternative: Display of air kerma values (preceding item: accumulated air kerma).
- After every five minutes of radiation, an audible alarm sounds at the C-arm system.
 - ✧ To temporarily deactivate the warning signal, press the **Reset fluoro time** button on the C-arm system (4).

ADR stop, manual input of radiation parameters

All exposures are taken with automatic exposure control. This rule is turned off using **ADR stop**. The kV values can then be selected manually.

- ✧ Select **ADR stop** at (5).
- ✧ If required, set a manual value with the **kV buttons** (6).
- kV and mA values are shown on the display at the C-arm system (7).
- As long as **ADR stop** is activated, the manually set value remains unchanged.



High-contrast fluoroscopy (Power Mode)

Power Mode is an additional function that can be selected for the fluoroscopy mode.

With **Power Mode** a higher contrast is achieved, but with a higher dose.

- ✧ Select the **Power Mode** function at the C-arm system (1).
- If the **Power Mode** function is activated, a continuous warning signal sounds during fluoroscopy.
- The duration of the **Power Mode** function is limited to 15 s.

Examination Procedure



The rotation is performed without radiation and can be observed on the monitor.

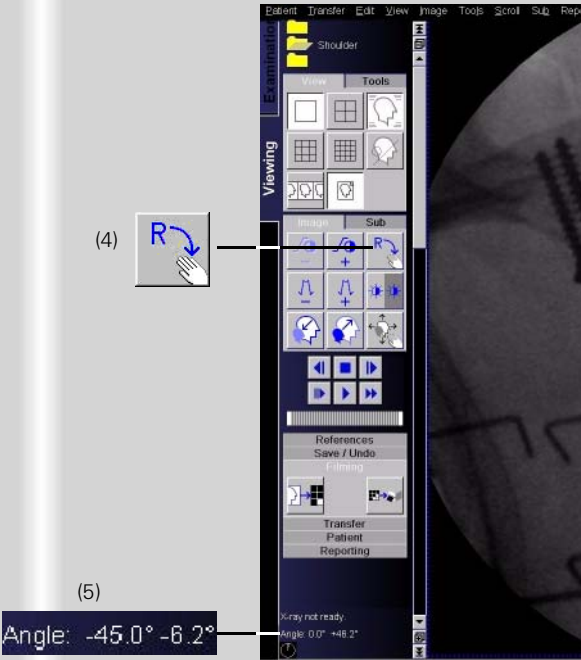
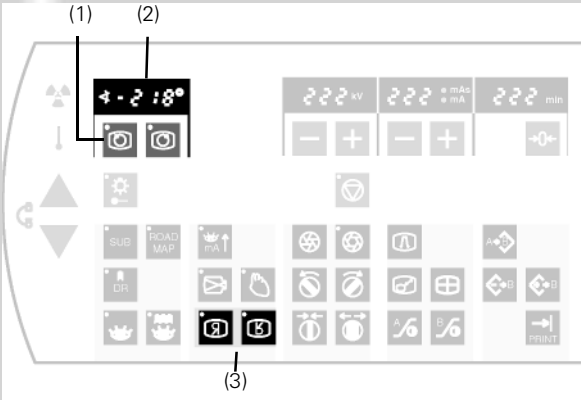


Image rotation and reversal

At the C-arm system

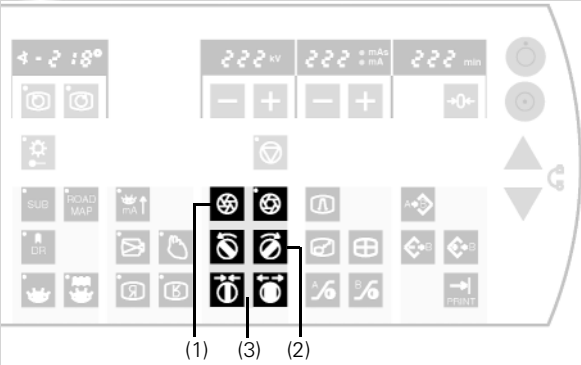
- ✧ Press one of the **image rotation** buttons for the required direction of rotation (1).
- The angle of rotation in relation to the starting position is shown (2).
- ✧ Press one of the **image reversal** buttons to flip the image horizontally or vertically (3).
- The next time radiation is released, the fluoroscopy image is in exactly this position.

At the monitor trolley

Image display and processing in the **Viewing** and **3D** task cards is possible only for stored images (e.g. single exposure).

- ✧ Activate the image rotation function (4).
- ✧ Rotate the image with the left mouse (keep left mouse button pressed).
- Angle display in the control area (5):
First value = angle of rotation in relation to starting position.
Second value = angle of rotation in relation to last image setting.

Examination Procedure



Collimator setting

For radiation protection reasons collimators should be inserted. These can be set at the C-arm system.

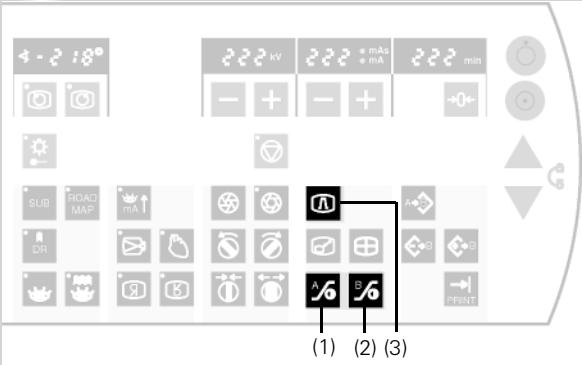
- (1) Moves the iris diaphragm into/out of the beam path
- (2) Rotates the semitransparent diaphragm
- (3) Moves the semitransparent diaphragm into/out of the beam path

The iris diaphragm is a multileaf collimator used for concentric collimation of the radiation beam (4).

- ✧ Activate the iris diaphragm for small objects, e.g. the wrists (1).

The semitransparent diaphragm acts as a density compensation. A diaphragm is moved close to the extremity on both sides. Apart from reducing radiation, this prevents overexposure at the edges of the extremities (5).

- ✧ Rotate the semitransparent diaphragm corresponding to the position of the object (2).
- ✧ Adapt the semitransparent diaphragm to the size of the object (3).



Changing the contrast

If the image quality is insufficient, a different gray-level curve can be selected at the control panel of the C-arm system during the examination to change the contrast of the image (and all further images).

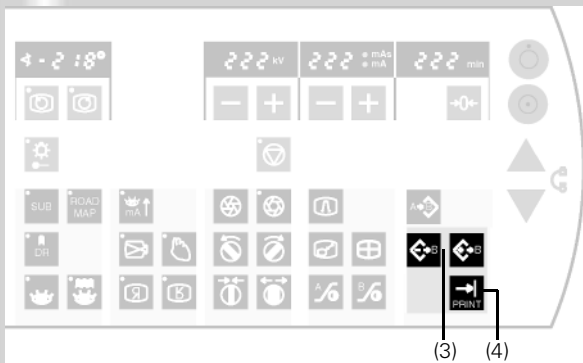
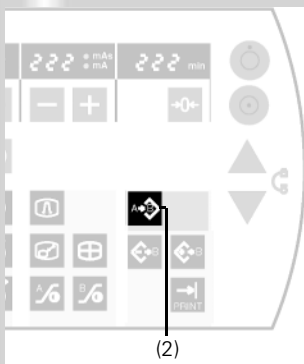
In addition, the edge enhancement of the live images can be changed.

- ✧ If necessary, repeatedly press the following buttons to change between preset values:
 - (1) Change contrast left monitor
(**Examination** task card)
 - (2) Change contrast right monitor
(**References** task card)
 - (3) Change edge enhancement right monitor
(**References** task card)

Examination Procedure



At the end of radiation, the image last acquired is displayed (LIH, Last Image Hold). If radiation is released again, the LIH image is overwritten.



Saving images

Single exposure

In this operating mode the generated images are automatically saved in the local database of the **Patient Browser**.

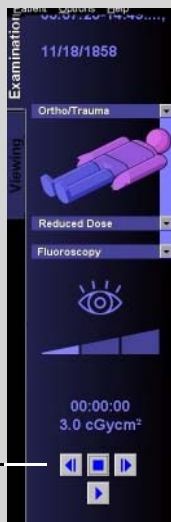
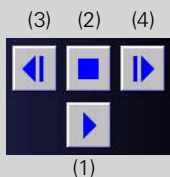
Fluoroscopy, pulsed fluoroscopy, subtraction, Roadmap

In these operating modes images are stored in the temporary image memory and overwritten by new images.

- ✧ To manually save the current image, press one of the following buttons:
 - (1) **Save image** button on the hand switch
 - (2) **Save image** button on the C-arm system
- ✧ This image is displayed in the **References** task card and stored in the local database.

Scrolling and printing

- ✧ Scroll backward/forward through the stored images in the **References** task card (3).
- ✧ Print out individual images from the **References** task card with a local printer (option) (4).



If **Autoloop** (option) is configured in the exam set used, review of the scene is started automatically at the end of radiation.



You can load the scene into the **Viewing** task card at any time and review it there.



If the MPPS option is installed, the **Modality Performed Procedure Step** window for performance documentation is now displayed.



In the Configuration menu (**Options > Configuration > Transfer**), define the rules for the autotransfer, e.g.:

- ☐ Required processing status
- ☐ Target addresses
- ☐ Data type

Fluoro Loop/LSH (option)

In the fluoroscopy, subtraction and Roadmap modes, scenes can be reviewed and stored (Last Scene Hold) during the examination.

Reviewing a scene

After radiation is ended, the buttons for controlling the scene review are displayed.

- (1) Start
- (2) Stop
- (3) Previous frame
- (4) Next frame

Storing the scene

As soon as the scene has been reviewed, it can be stored.

- ✧ Select **Patient > Save LSH Scene** or press function key F9 on the keyboard.
- The current scene (up to 120 images) is stored in the local database.

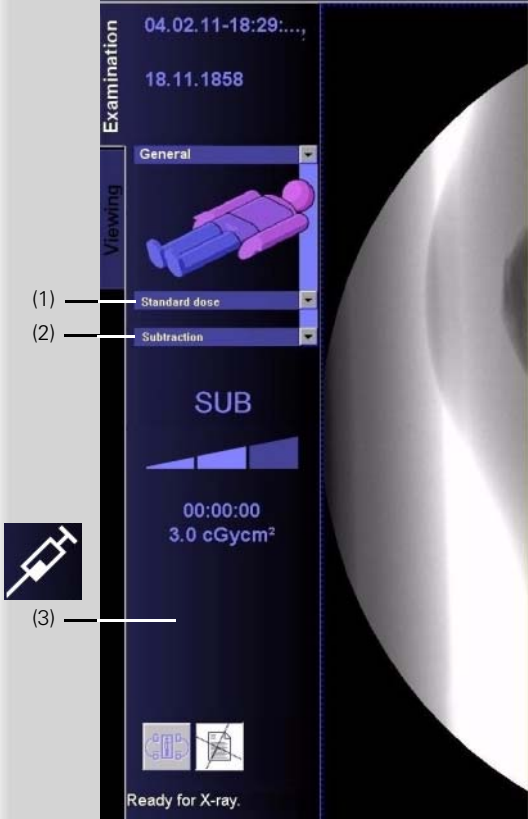
Ending the examination

- ✧ Call up **Patient > End Exam** in the main menu.
- Patient and examination data are deleted from the **Examination** card.
- If **Automatic transfer** is activated, the examination images are automatically saved to CD-R or sent to the information system (option).

Subtraction and Roadmap



The **Subtraction** and **Roadmap** modes are an option for C-arms used in cardiac and vascular surgery.



Performing a subtraction scene

Contrast medium injected into the vessels helps to show vessels and changes of/in these vessels (e.g. aneurysms, ruptures).

Procedure

- ✧ Prepare the examination in the **Examination** task card:
 - (1) Selection of the required application program
 - (2) Selection of the **Subtraction** mode
- ✧ Trigger the subtraction scene with the left footswitch or the hand switch.

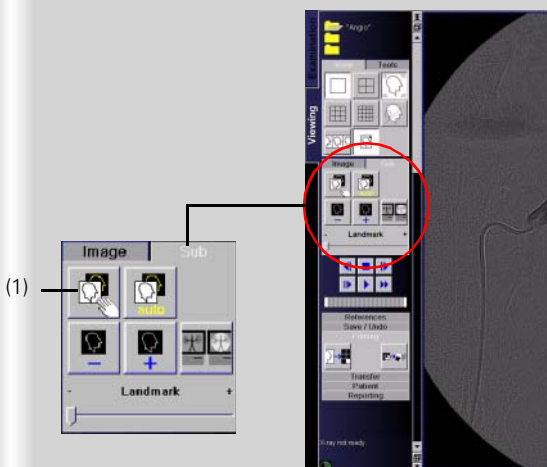
The footswitch or hand switch must remain pressed during the entire series. If the series is interrupted, it must be started again from the beginning.

- (3) The syringe symbol appears in the **Examination** task card. The physician now injects the contrast medium.
 - ➞ After a few seconds the syringe symbol disappears again. The physician can end the contrast medium injection. The contrast medium bolus remains displayed.

Subtraction and Roadmap



If **auto store** is activated in the configuration menu, the images of a subtraction scene are automatically saved in the local database. They can then be retrieved for postprocessing at the end of the examination.



Postprocessing a subtraction scene

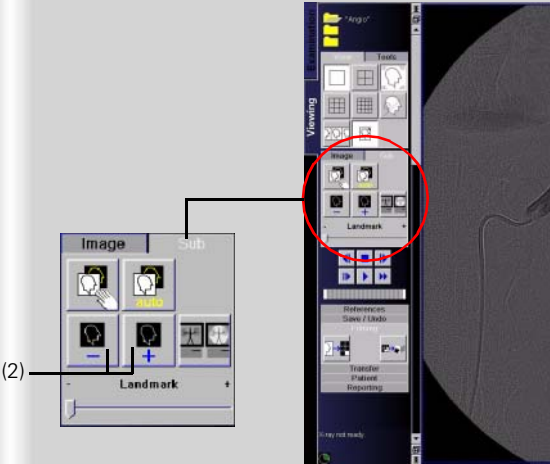
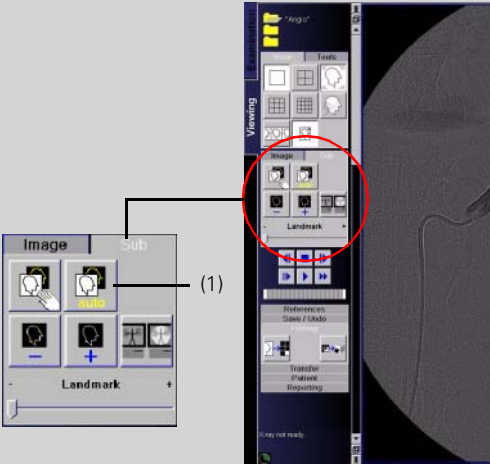
- ✧ First, load the subtraction scene from the **Patient Browser** into the **Viewing** task card.

Pixelshift

Pixelshift allows you to make the mask and fluoroscopy image coincide.

This function is used if the position of the patient has changed in the course of the series in relation to the position of the mask.

- ✧ Click the **Pixelshift** button (1).
- The mouse pointer appears as an arrow.
- ✧ Using the mouse, move the mask and fluoroscopy image so that one is on top of the other.
- In the lower image area it is indicated by how many pixels the mask was shifted in the x-plane (= to the left or right) or the y-plane (= up or down).



Auto Pixelshift

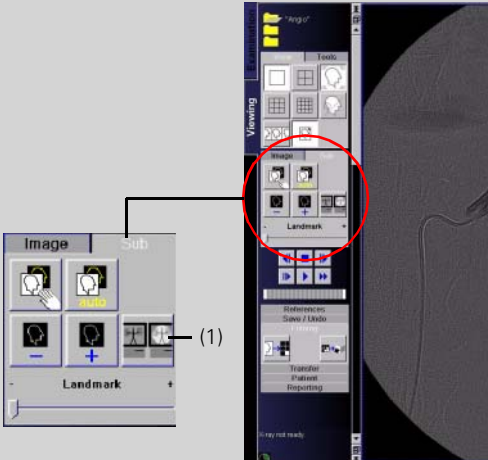
This function allows automatic pixelshift for a selected region.

- ✧ Click the **Auto Pixelshift** button (1).
- The mouse pointer changes into a square.
- ✧ Move the square to the area in the image where the misalignment can clearly be seen.
- ✧ Press the left mouse button.
- The mask and fluoroscopy image are made to coincide optimally in the marked area.
- The shift of the mask in the x and y axis is indicated in the bottom right image area.

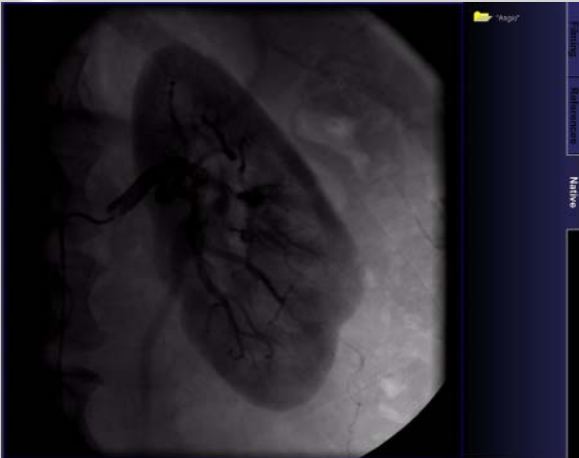
Selecting a different mask

The selected application program defines which of the generated images is used as the mask in the subtraction series. This image is then subtracted from all following images.

- ✧ Click on **Mask Next** or **Mask Previous** (2).
- The mask for this series is changed in individual steps. This change is automatically adopted for the entire series.



(2)



Dual channel function

With this function the entire series is displayed unsubtracted during postprocessing in the **Native** task card (on the right-hand monitor).

At the same time, the subtracted display is shown in the **Viewing** task card (on the left-hand monitor).

- ✧ Click the **Dual channel function** button (1).
- The entire series is additionally shown unsubtracted on the right-hand monitor, even when scrolling through individual images of the series.

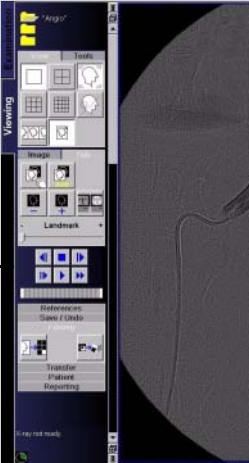
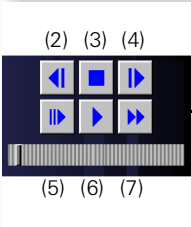
Native display in the Native task card

The image shown in the **Native** task card directly corresponds to the image of the series shown in the **Viewing** task card (2).

- ✧ Scroll through the individual images of the series in the **Viewing** task card.
- The **Native** task card always shows the corresponding image unsubtracted.



(1)



Landmark

The **Landmark** function allows you to subsequently add an anatomical background for orientation purposes (0 to 30 %).

- ✧ Keeping the left mouse button pressed, drag the bar to the required value (1).

Movie mode

The replay of the subtraction scene can be repeated in the **Viewing** task card.

- ✧ Select the required function with the mouse:
 - (2) Scroll image back
 - (4) Stop the movie function
 - (5) Scroll image forward
 - (6) Replay series at half the speed
 - (7) Replay series in real time
 - (8) Replay series at double speed



During catheter placement the images are not automatically stored.

To manually save images, use the save button on the hand switch or C-arm system.



It is not necessary to create a subtraction scene if the Roadmap exam connects to a subtraction angiography. The existence of a subtraction screen is then indicated by a screen icon.

SUB 

- ✧ In this case, press the ROADMAP button on the control panel *once*.
- ✧ Immediately start catheter positioning under fluoroscopy control.

Roadmap

The Roadmap mode is also used in vascular surgery. This mode is used to place catheters in vessels under fluoroscopy.

The examination comprises the following steps:

Generation of a subtraction scene

- ✧ Select the Roadmap operating mode in the **Examination** task card.

The procedure is the same as that described in Section *Performing a subtraction scene*.

- ❑ First, a mask is generated.
- ❑ Then, the vessel is filled with contrast medium and displayed using subtraction technique.

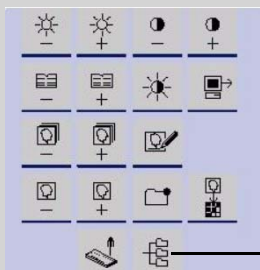
Catheter positioning in the vessel

- ❑ If radiation is released again, the catheter placement is shown in real time in the **Examination** task card.

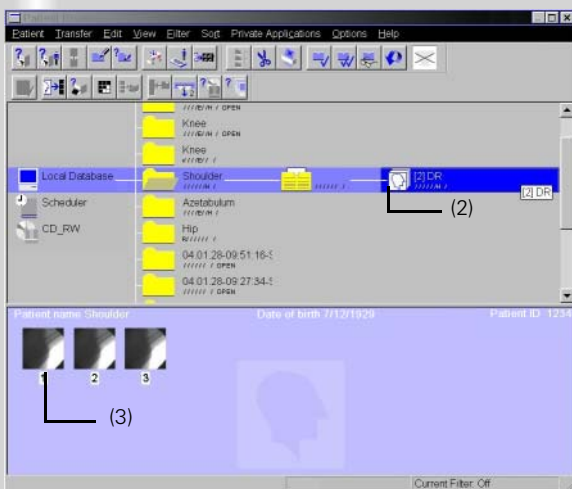
Postprocessing



2D images are postprocessed in the **Viewing** task card.

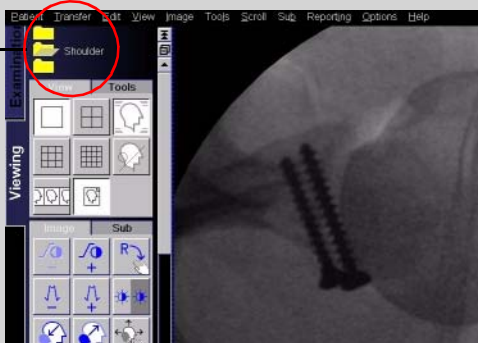


(1)



(3)

(4)

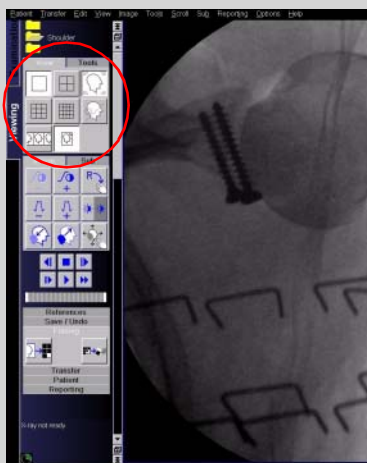
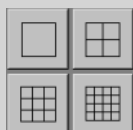


Loading patient images into the Viewing task card

- ✧ Open the **Viewing** task card.
- ✧ Open the **Patient Browser** with the **Call up Patient Browser** button on the monitor trolley (1).
- ✧ Load the required series into the **Viewing** task card with a double click (2).
- ✧ To load individual images, double-click on the image symbol (3).
- ✧ The name of the patient is displayed in the control area of the **Viewing** task card (4).

Postprocessing

(1)



(2)



(3)



(4)

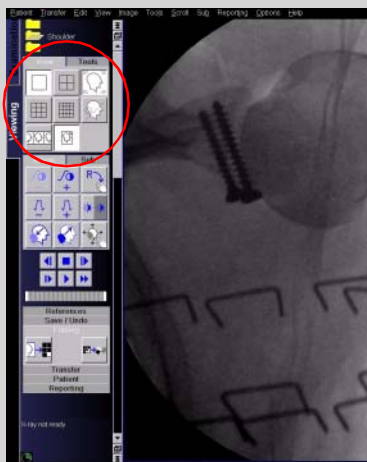


Image display

In the **View** subtask card you can choose between different monitor layouts.

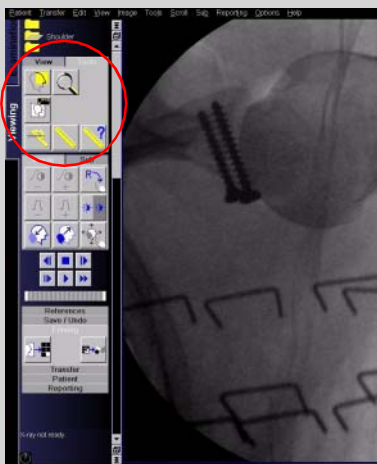
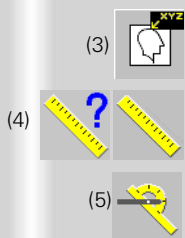
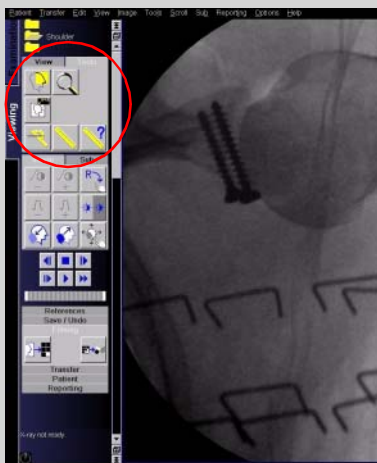
(1) Different screen divisions

(2) Hiding graphics and patient data in the image area

(3) Stripe display:
the images are arranged *next to each other*

(4) Stack display:
the individual images are arranged *one on top of the other*

Postprocessing



Measuring and annotations

In the **Tools** subtask card images can be measured and annotations can be added.

(1) Diaphragms

The subsequent simulation of diaphragms improves the visualization of fine structures that are difficult to see in the image

(2) Magnifying glass

Individual areas of the loaded image are shown enlarged

(3) Annotations

Entering annotations for image areas via the keyboard

(4) Calibrating and measuring distances

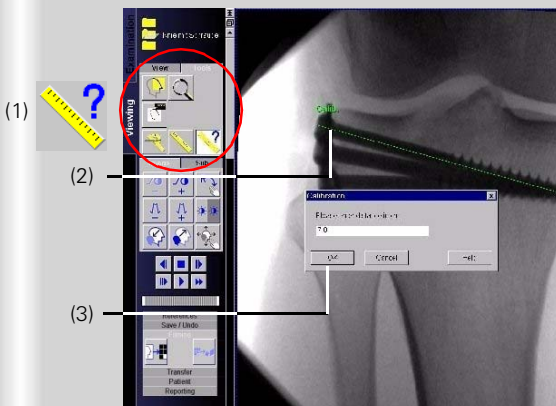
(5) Angle measurement

The angle between two straight lines to be drawn is indicated

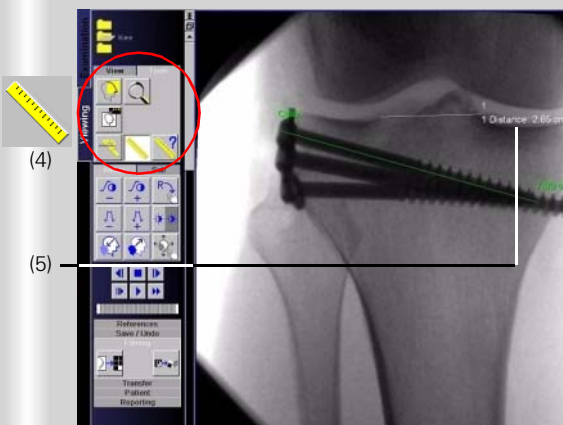
Postprocessing



Distances cannot be measured directly in the images, since the position of the object in the beam path and thus the magnification effect is not clear. A calibration must be performed first before a distance can be clearly determined.



The calibration object must be perpendicular to the central ray in the area of the structure to be measured (generally in the center of the measuring field to avoid I.I. distortion).



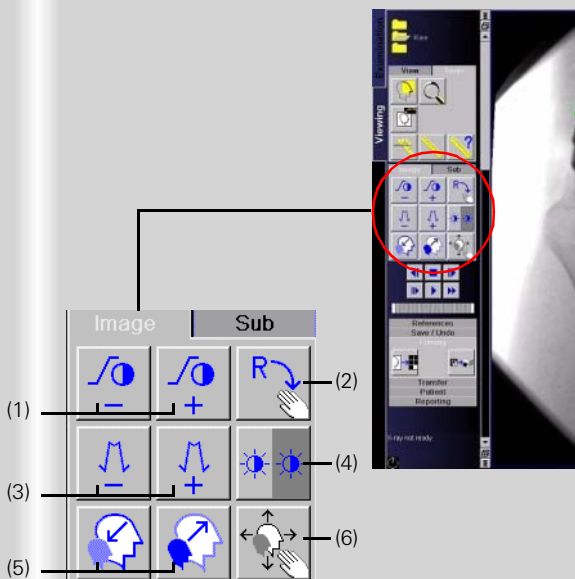
Calibrating and measuring distances

❑ Calibrating (1st step)

- ✧ Activate the **calibration** function by clicking the corresponding button (1).
- A green line appears in the image area which can be lengthened, shortened and positioned as desired with the mouse (2).
- ✧ Draw the line along a known distance (2).
- As soon as you release the mouse button, a dialog box appears (3).
- ✧ Enter the known distance and confirm with **OK** (3).
- The calibration is shown in the image area. At the same time, a measuring scale appears on the right edge of the image.

❑ Measuring distances (2nd step)

- ✧ Activate the **Distance** function by clicking the corresponding button (4).
- ✧ Using the left mouse button, draw a line along the required structure.
- As soon as you release the left mouse button, the distance from the start to the end point of this line is shown (5).



Edge enhancement (3) means artificially increasing the difference between two gray levels.

Image manipulation

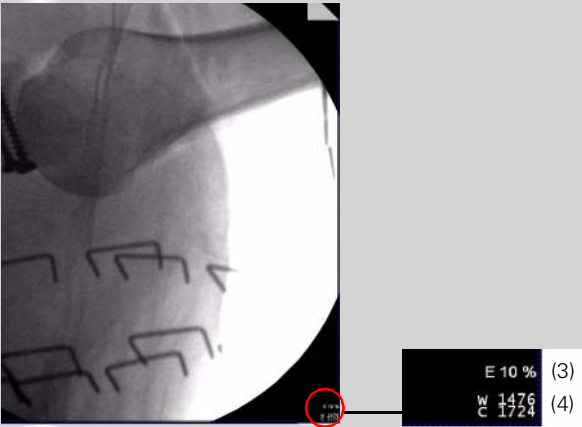
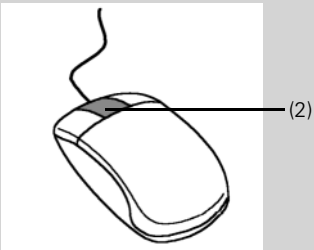
Images can be postprocessed in the **Image** subtask card.

- ✧ Prior to postprocessing, activate the required function by clicking the corresponding button:
- (1) Change of contrast
The contrast is changed in four defined steps
- (2) Image rotation
Rotation with the left mouse button pressed
- (3) Edge enhancement
Edge enhancement is increased/reduced in steps of ten
- (4) Grayscale inversion
Change from positive to negative image
- (5) Double/half image size
- (6) Zoom/pan the image
Mouse at image edge: change image size
Mouse in image center: pan image

Postprocessing



Windowing means changing the gray levels in an image and thus the brightness (center of the grayscale) and contrast (width of the grayscale) of the image.



Windowing

- ❑ With buttons/softkeys
 - ✧ Select the preset contrast levels by clicking the buttons (→ Page 61).

- ❑ With the keyboard of the monitor trolley
 - ✧ Select the brightness and contrast step by step (1).

- ❑ With the mouse on the monitor trolley
 - ✧ With the middle mouse button pressed, move the mouse in the image (2).
Up/down movement changes the brightness
Movement to the left/right changes the contrast

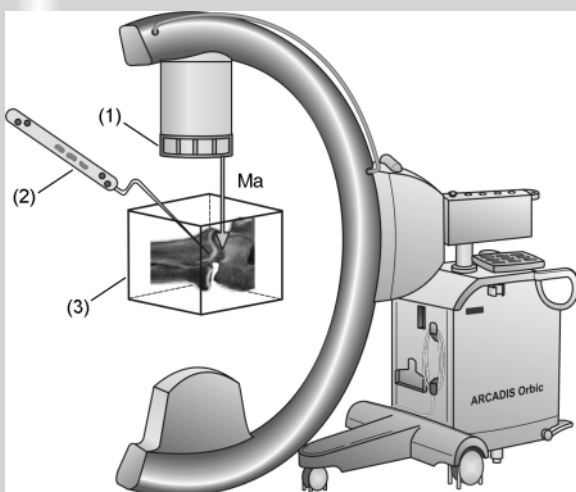
Display of window values

Edge enhancement and gray values of the image are displayed in the lower image area:

- (3) Edge enhancement
- (4) Grayscale window
 - W = window width (contrast)
 - C = window center (brightness)



Regular calibration of the system is an important requirement to ensure good image quality of the 3D scans.



Overview

The 3D option consists essentially of motor control of the orbital movement which can be switched in optionally and a task card for 3D image reconstruction and visualization.

Areas of application

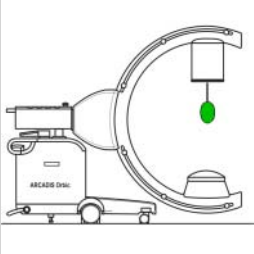
The 3D option is suitable for intraoperative use in the following areas:

- ❑ Bones and joints of the upper and lower extremities
- ❑ Entire spine
- ❑ Hip and pelvic region
- ❑ Facial bones

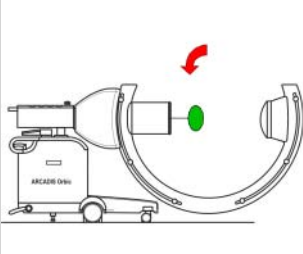
NaviLink-3D (option)

NaviLink-3D enables the use of different optical navigation systems. For registration, the position and orientation of the 3D data set are transferred with a matrix "Ma".

- (1) Navigation marker ring
(registration unit)
- (2) Pointer
- (3) 3D data set (cube)

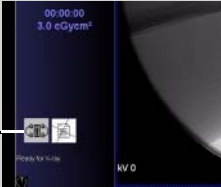


(1)



(2)

(3)



(4)

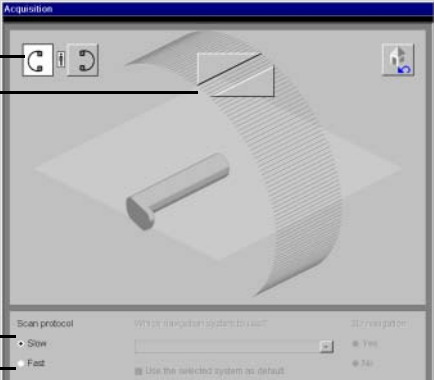
(5)



(6)



(7)



3D scan

The 3D application comprises the following steps:

Adjustment

Adjustment with the I.I. laser aimer is performed in two C-arm positions.

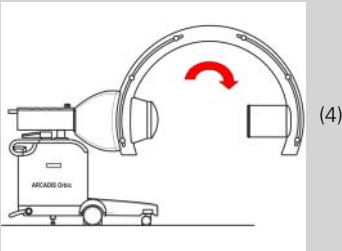
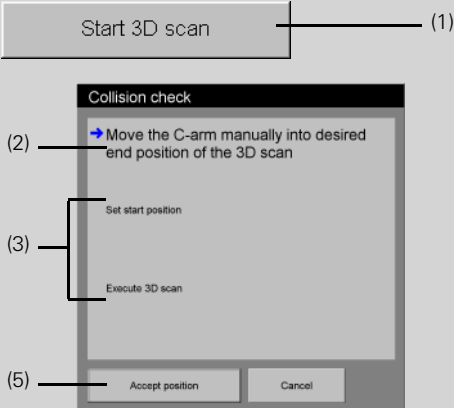
(1) Horizontal

(2) Vertical - 90°

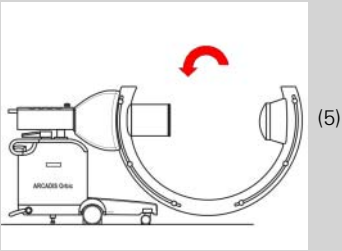
- ✧ Bring the object to be examined into the isocenter.
- ✧ Lock all brakes.

Defining the orientation

- ✧ Click on this button in the **Examination** task card (3).
- ✧ In the **Acquisition** window displayed, click the body region to be examined (4).
- ✧ The other body regions are hidden and new control elements are shown in the dialog box.
- ✧ Enter the patient position, system orientation and scan speed:
 - (5) Buttons for C-arm position (left/right of the patient table; viewing direction headwards)
 - (6) Arrow buttons for patient position (rel. to table)
 - (7) Radio buttons for scan speed (slow = 100 frames/scan, fast = 50 frames/scan)



After the test run you must not change the position of the C-arm or change any settings of the entire unit.



Test run (collision monitoring)

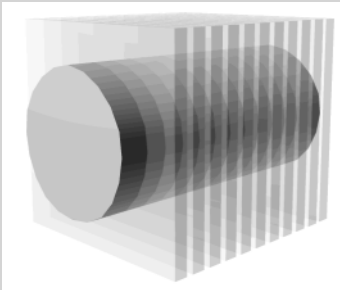
- ✧ Start the test run by clicking the button in the **Acquisition** dialog box (1).
- The **Collision check** dialog is displayed. This dialog informs you of the state of the test run and guides you through the procedure:
 - (2) Currently required procedure step
 - (3) Upcoming procedure steps
- ✧ Manually move the C-arm into the required end position (4)
(at least 120°, ideally: end position).
- ✧ Click **Accept position** in the **Collision check** dialog (5).
- ✧ Move the C-arm manually into the starting position for the 3D scan (4).

3D scan

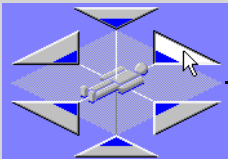
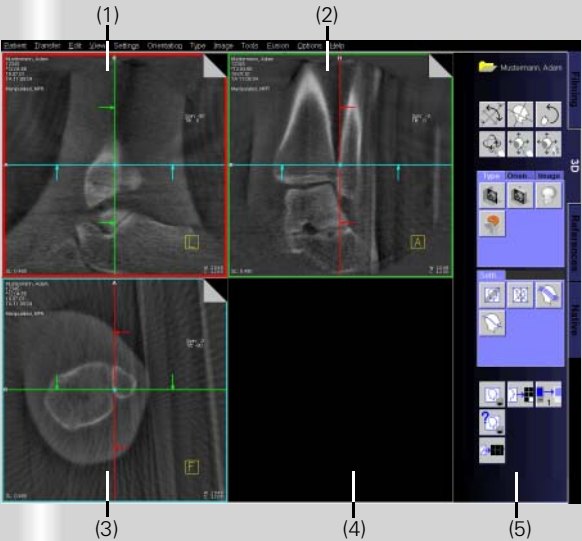
For the duration of the scan, the orbital movement of the C-arm is motor-driven (5).

- ✧ Keep a sufficient safety distance.
- ✧ Make sure that all brakes are locked.
- ✧ Press the left footswitch and keep it pressed during the scan
(fast scan = 50 frames = 30 s,
slow scan = 100 frames = 60 s).
- At the end of the 3D scan the data set is automatically loaded into the **3D** task card for further evaluation.

3D option



Showing/hiding the cross-hair by clicking this button.



(6)



Return to the three standard views by clicking this button.



3D view

In the **3D** task card, a series (range) of two-dimensional slice images is reconstructed from the scanned 3D volume (MPR = [Multiplanar Reconstruction] display mode).

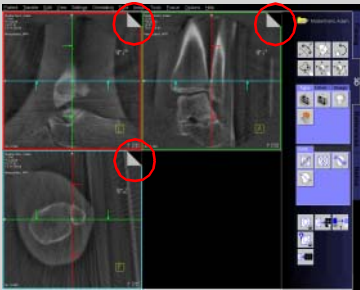
3D task card

The MPR series is displayed in the reference segments in the three standard views. The colored reference lines indicate the position and viewing direction (see arrows) of the cut planes in the two other reference segments.

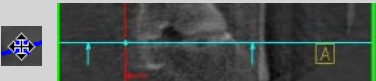
- (1) Reference segment (sagittal view)
- (2) Reference segment (coronal view)
- (3) Reference segment (transversal view)
- (4) Output segment for newly reconstructed images and series
- (5) Control area for image view/orientation, display mode, range calculation, output control

Changing the standard view

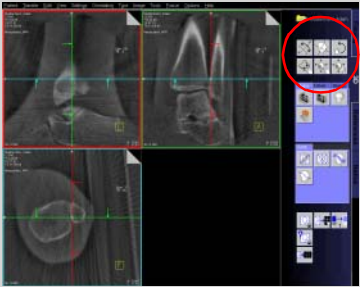
- ✧ Click a reference segment.
- ✧ Select the desired view for the segment in the **Orientation** subtask card (6).



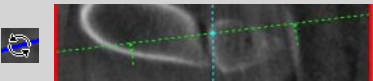
(1)



(2)



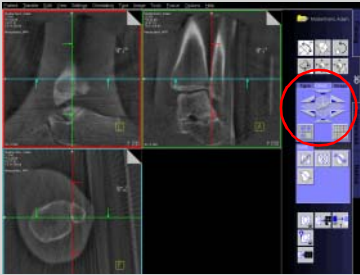
(3)



(4)



Ortho Sync is used, for example, to display slices along the main axis of a bone.



(5)

Moving a cut plane

- ✧ Use the dog ears to scroll forward or backward slice by slice in a segment (1).
- ✧ Move a reference line with the mouse to display the new slice position in the relevant segment (2).

Rotating a cut plane

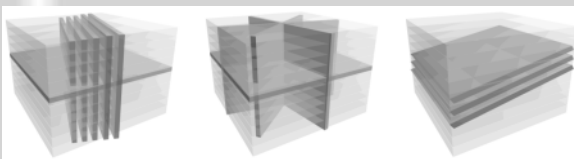
- ✧ Activate **Free Mode** by clicking the button (3).
- ✧ Rotate a reference line to display the new cut direction in the relevant segment (4).
- ✧ Deselect **Free Mode** to freeze the angle (3).

Using Ortho Sync

This function can be used to create orthogonal cuts for an arbitrary (reference) view.

- ✧ Create the required reference view in a reference segment by moving/rotating the cut plane.
- ✧ Click the **Ortho Sync** button on the **Orientation** subtask card (5).

3D option



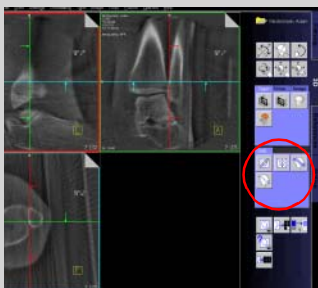
(1)

(2)

(3)



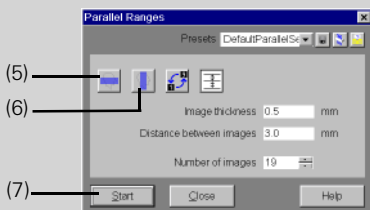
You can also outline subareas by drawing a curved cut line and then display this cut as a slice image.



(4)



(8)



(5)

(6)

(7)



You can change the settings with the mouse (moving the start/end line in the reference segment). If the distance between images is to remain constant, the **Constant number of images** function must be deactivated.



New 3D ranges

The **Settings** subtask card allows you to reconstruct new cut planes based on any reference image.

- (1) Range of parallel tomographic images
- (2) Range of radial tomographic images
- (3) Expanded range

✧ First, select the reference image with the required original view.

Generating parallel images

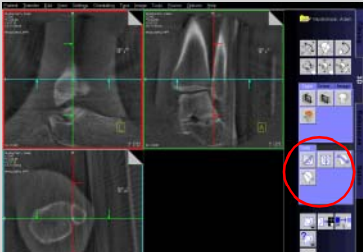
- ✧ Click the **Parallel Ranges** button (4).
- The **Parallel Ranges** dialog is displayed.
- ✧ Enter the image thickness, distance between images and number of images and confirm each entry with the return key.
- ✧ Define the orientation of the cut planes: Horizontal button (5) or Vertical button (6).
- ✧ Click **Start** (7).
- The new range is shown in the output segment.

Generating an expanded range of images

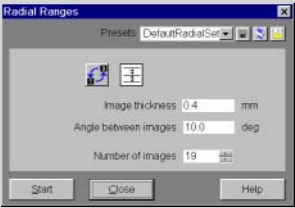
An **expanded range** consists of tomographic images parallel to the reference image (instead of vertical as with **parallel ranges**).

- ✧ Click **Expand Ranges** to call up the function (8).
- The settings are made analogously to those for parallel images.

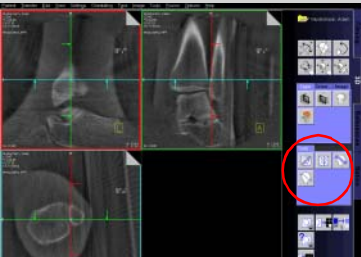
3D option



(1)



(2)



(3)



(4)



(5)



Note that with curved cuts no orientation aids are displayed in the image. The performing physician is responsible for the professional and correct interpretation of the reconstructed image.

Generating radial images

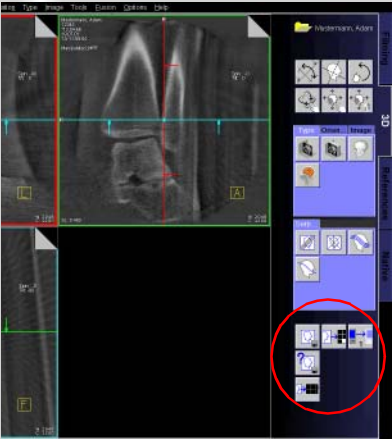
- ✧ Click on the **Radial Ranges** button (1).
- ✧ In the **Radial Ranges** dialog, enter the image thickness, angle between images and number of images (2).
- ✧ Click **Start**.
- The new range is shown in the output segment.

Generating curved cuts

- ✧ Click the **Curved Mode** button (3).
- ✧ Using the mouse, draw the required cut line in the reference image (4).
- ✧ End the line with a double click.
- The reconstructed slice image is shown in the output segment (5).



Selection of the entire image stack with the **Edit > Select series** menu.



- (1)
- (2)
- (3)
- (4)

Saving, filming, transferring

- ✧ First, click the image to be processed.

Saving quickly

The new images are saved in the currently loaded series under the relevant patient name.

- ✧ To do this, click the **Save** button (1).

Saving in a new series

The new images are saved as a new series with the relevant patient name.

- ✧ Click the **Save as** button (2).
- ✧ Enter the data of the new series in the **Save as** dialog.

Filming

- ✧ Click the **Copy to Film Sheet** button (3).
- The selected images are transferred to the **Filming** task card.

Transferring to the Viewing task card

- ✧ Click the **Load to Viewing** button (4).
- The related 2D images of the displayed scan are loaded to **Viewing**.

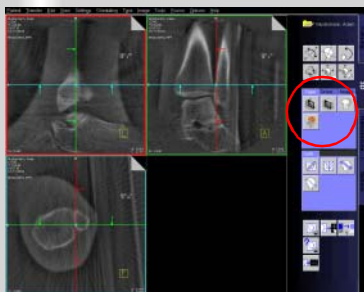
3D option



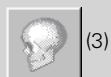
The display mode can be changed in any reference segment at any time.



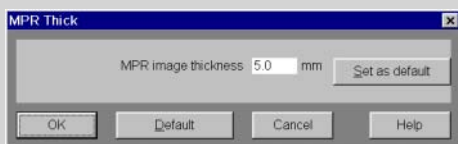
To reset the standard display mode, click the **MPR** button.



(1)



(3)



(2)



(4)

3D display modes

From the MPR standard display you can switch to the following display modes for the scanned volume:

- ❑ MPR Thick
Images with adjustable slice thickness
- ❑ SSD (Shaded Surface Display)
Three-dimensional surface reconstruction
- ✧ First, click the segment for which you want to change the output type.

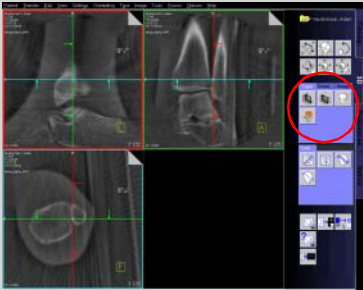
Setting MPR Thick

- ✧ Using the left mouse button, click the **MPR** button on the **Type** subtask card (1).
- The display mode is changed.
- ✧ To set a different slice thickness, click the **MPR** button (1) with the right mouse button.
- ✧ Enter the required slice thickness in the dialog displayed and confirm with **OK** (2).

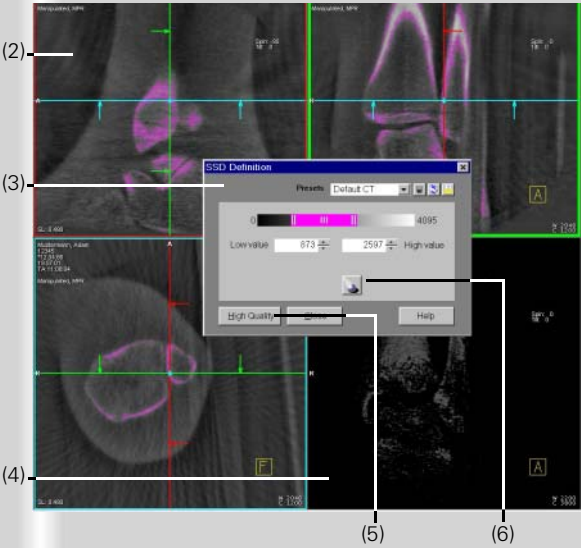
Setting SSD

- ✧ Click the **SSD** button on the **Type** subtask card (3).
- The SSD reconstruction is performed in the selected reference segment (4).

3D option

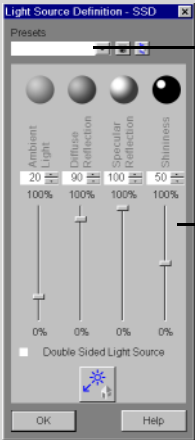


(1)



(5)

(6)



(7)

Changing the SSD threshold

If necessary, the preset threshold values for the surface reconstruction can be changed individually.

- ✧ Click the **SSD** button (1) with the right mouse button.
- ✧ The display of the **3D** card is reset for optimizing the threshold values:
 - (2) Reference segments in MPR mode (areas within threshold values highlighted)
 - (3) **SSD Definition** dialog
 - (4) Output segment with SSD display based on current threshold values
- ✧ Change the threshold values with the slider or enter new values in the input fields.
- ✧ Click the **High Quality** button (5).

Setting the SSD light source

You can change the light source to achieve a better display of the surface condition of anatomical structures.

- ✧ Click the **Light Source Definition - SSD** button (6).
- ✧ Select one of the presets or set the required values with the sliders (7).
- ✧ Confirm with **OK**.

3D option



You need two volume data sets for a fusion evaluation: the *reference series* serves as the anchor point for superimposing, the *model series* is spatially aligned with the reference series.

(1)



(2)



Both image series should cover approximately the same exam region.



3D Image Fusion (Option)

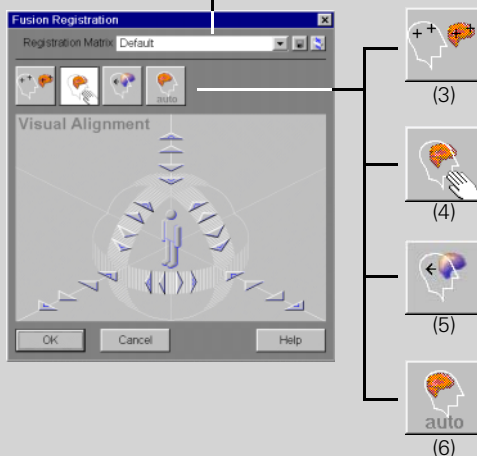
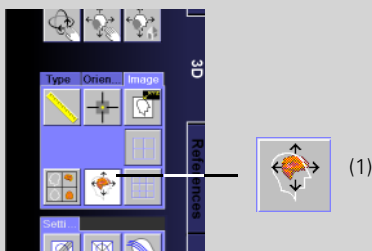
The Fusion function allows you to combine the results of different acquisition techniques or images acquired at different times by superimposing them.

Load image datasets.

- ✧ Select the reference series in the **Patient Browser**.
- ✧ Click the **3D MPR** button (1).
- ✧ Select the model series in the **Patient Browser**.
- ✧ Click the **Fusion** button (2).

The images of loaded the reference and model series are shown superimposed in the first three segments.

- (3) Image area
Three orthogonal views of the loaded images
- (4) **Settings** subtask card
Buttons for superimposing and viewing images
- (5) **Fusion Registration** dialog
Control elements for superimposing images



You can alternate orientation modes or run several one after the other until you have the optimal superimposition.



Use this button to save the interim results and the final results of the orientation. You can return to this orientation (*user-defined*) at any time using the **Registration Matrix** selection list.



Start orientation of image series

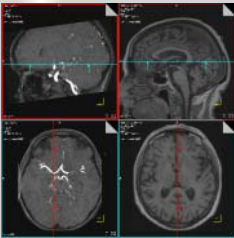
- ✧ If it is not already displayed, open the **Fusion Registration** dialog using this button (1).

- ✧ Select a registration matrix (2):
 - ☐ *Default*
if there is no suitable default orientation
 - ☐ *User-defined*
if a suitable orientation has already been saved as a matrix

- ✧ Select the desired orientation mode:
 - (3) **Selection points**
Anchor the image series to appropriate reference points
 - (4) **Visual Registration**
Optical (manual) superimposition
 - (5) **Surface Matching**
Orientation based on set threshold values depending on the tissue structure
 - (6) **Auto Registration**
Automatic superimposition

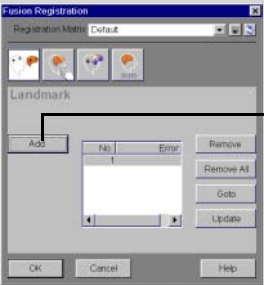
- ➡ The display of the image area depends on the mode. The corresponding tools are displayed in the **Fusion Registration** dialog.

3D option

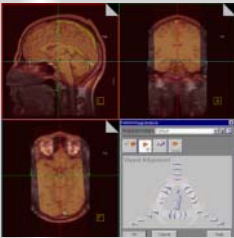


(1)

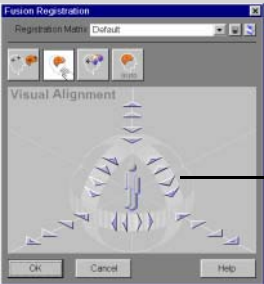
(2)



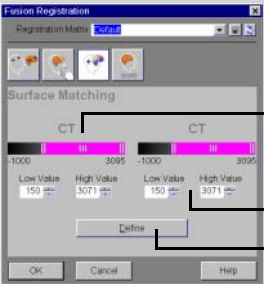
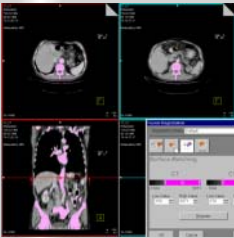
(3)



(4)



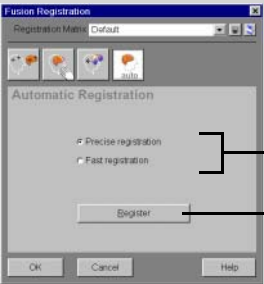
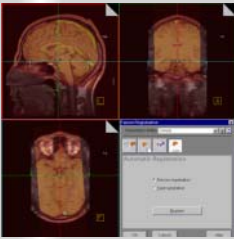
(5)



(6)

(7)

(8)



(9)

(10)

Aligning the landmarks (optional)

- ✧ Holding down the left mouse button, position the cross-hair on a marked point (1) in the reference segments (left).
- ✧ Mark the same position in the model series (right) (2).
- ✧ Click **Add** (3).
- ✧ Define at least two other pairs of reference points in the same way.

Visual Registration

- ✧ Select one of the three segments with the superimposed series (4).
- ✧ Use the directional and rotational arrows to visually align the model series to the reference series (5).

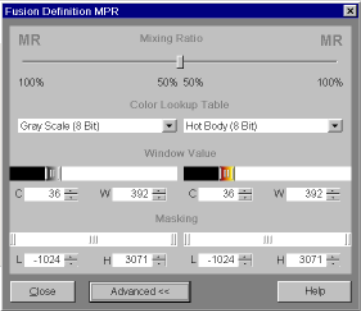
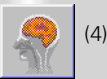
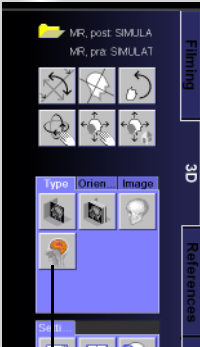
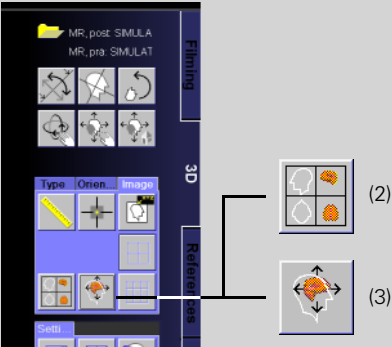
Surface Matching

- ✧ For the reference series, define the modality-specific threshold value of a tissue structure (e.g. bone, skin) (6).
- ✧ Select the corresponding thresholds for the model series (7).
- ✧ Start the superimposition using the **Define** (8) button.

Automatic Registration

- ✧ Select **Precise registration** for a precise superimposition or **Fast registration** for a fast superimposition (9).
- ✧ Start the superimposition using the **Register** button (10).

3D option



(5)

Apply superimposition

- ✧ Click **OK** to close the superimposition (1).
- The registration matrix with the superimposition data is saved as a data object in the reference series.

Show superimposed images

Change the display using the **Image** subtask card:

(2) **Side-by-Side**

The reference images are shown on the left; the sample images are displayed on the right (similar to registration with **Landmarks**).

(3) **Fusions Mode**

Reference images and sample images are shown in different colors (like **Visual Registration**).

Editing the display

- ✧ Using the right mouse button, click the **Fused MPR** button on the **Type** subtask card (4).

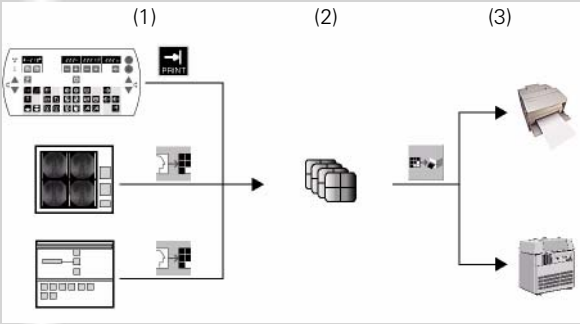
Change the display in the **Fusion Definition MPR** dialog box (5) that appears:

- ☐ **Mixing Ratio**
Emphasize one of the two datasets
- ☐ **Color Lookup Table**
Color differentiation of the datasets
- ☐ **Window Value**
Separate windowing of the datasets
- ☐ **Masking**
Hide individual grayscale ranges in the datasets



In radiology the terms "filming" (= printing process), "camera" (= output device) and "exposing" (= printing) are used for the printing of patient images.

The *syngo* user interface uses corresponding terms.



(4)



(5)

Printing

If the printing function is configured, the **Filming** task card additionally appears on the right monitor.

Here, the images to be printed are collected in film sheets, processed if necessary, and then sent to the printer as a film job.

Procedure

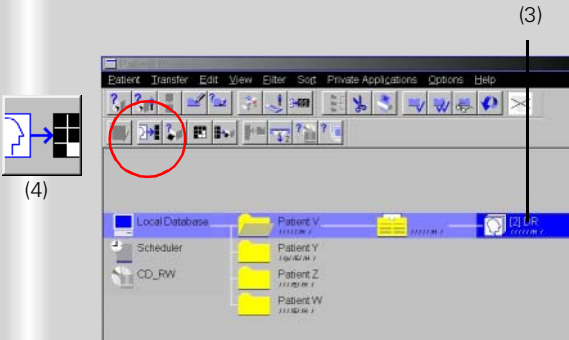
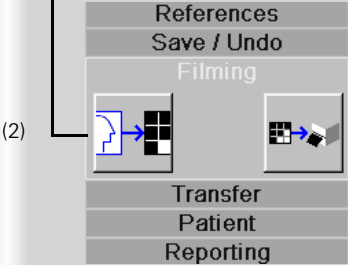
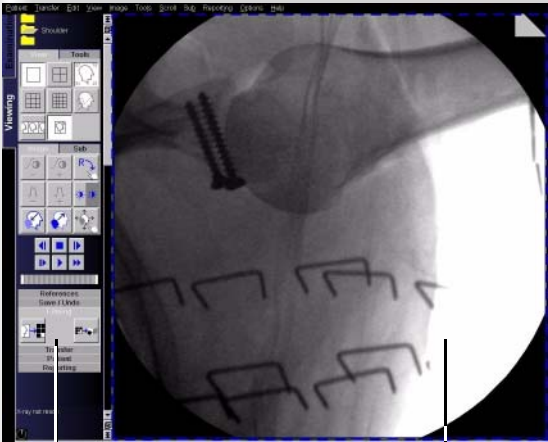
- (1) Copying images to the film sheet:
 - from the C-arm system
 - from the **Viewing** task card
 - from the **Patient Browser**
- (2) Editing/checking the film sheet:
in the **Film Preview** dialog or in the **Filming** task card
- (3) Printing the film job:
 - on a local printer
 - on a network printer

With a local printer you can print individual images on paper or X-ray film directly in the OR.

Printing in the network is possible if a network printer (e.g. central printer in the OR or the radiology department) is connected via the network connection (4).

Copying images to the film sheet from the C-arm system (for local printing)

- ✧ Press the **Print** key on the control panel of the C-arm system (5).
- The image shown on the right monitor is copied to the film sheet.
- The local printer is preset as output device for the print job.



Copying images to the film sheet from the Viewing task card

Print jobs can be created in the **Viewing** task card in parallel with image postprocessing.

- ✧ Click the patient image to be copied to the film sheet (1).
- ✧ Then click **Copy to Film Sheet** (2).

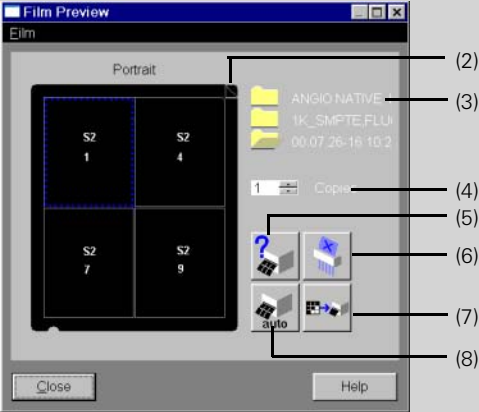
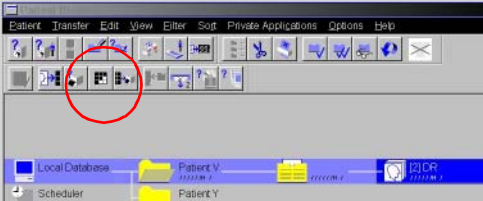
Copying images to the film sheet from the Patient Browser

If the complete data record of a patient is to be printed on film, this can also be done directly from the **Patient Browser**.

- ✧ Click the series to be printed in the local database of the **Patient Browser** (3).
- ✧ Copy the patient images to the film sheet (4).

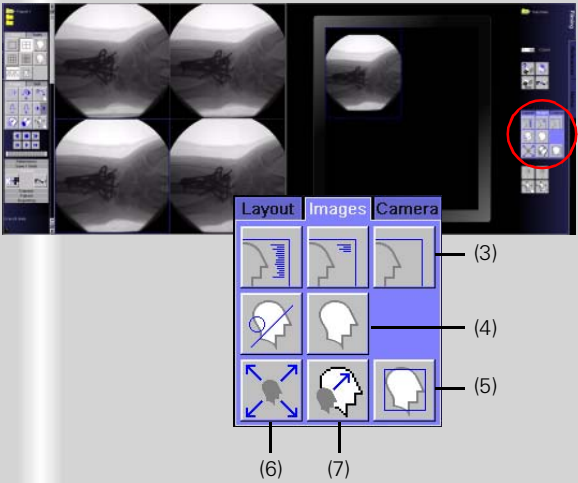
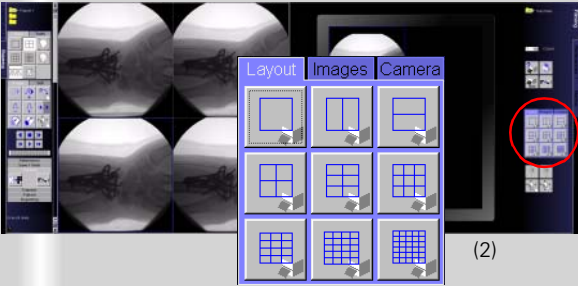
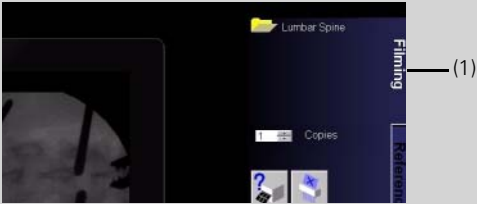


(1)



Checking the film job and printing from the film preview

- ✧ Click the **Film Preview** button in the **Patient Browser** (1).
- A dialog box is opened which shows different functions for the film sheet:
 - (2) Dog ears for scrolling through the film sheets
 - (3) Patient name
 - (4) Setting the number of copies of a film job
 - (5) Display of the status of individual film jobs, e.g. "queued", "completed" etc.
 - (6) Deleting individual images from the film sheet
 - (7) Sending the film job and exposing/printing the film
 - (8) Automatic sending of a film job when film sheet is full
- ✧ Click **Expose** to send the film job to the printer/camera (7).



Editing the film sheet in the Filming task card

- ✧ Click the **Filming** task card on the right monitor (1).

❑ Layout

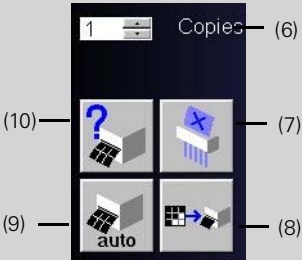
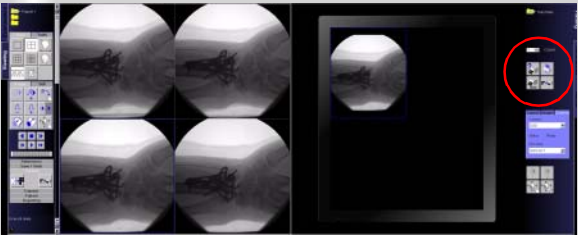
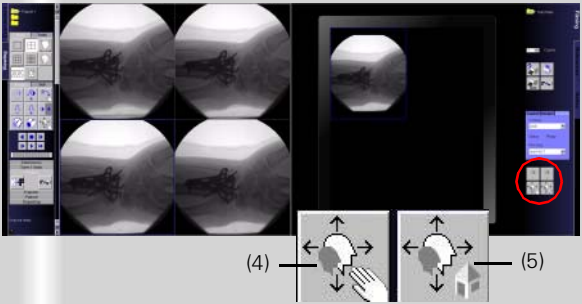
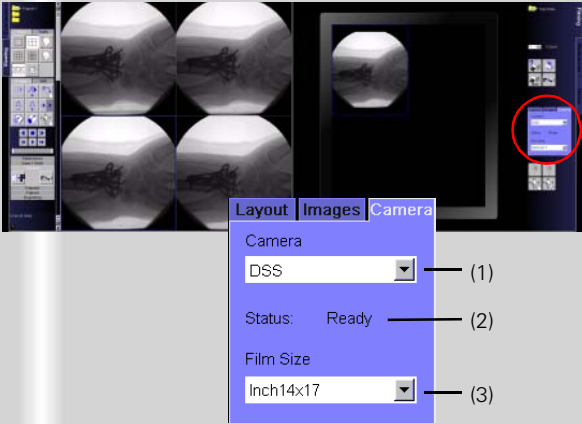
- ✧ Select the required film layout in the **Layout** subtask card (2).

❑ Image display

- ✧ On the **Images** subtask card, select the required display of the images on the film:

- (3) Select text to be printed on film
All patient text (name, date of birth etc.),
customized text or no text
- (4) Show or hide graphics (e.g. distance,
angle measurements)
- (5) Enlarge the image so that the shorter
sides fill the film segment. Parts can be
cut off from the longer sides
- (6) Adjust the image size to the film segment
- (7) Return to the original image

Documentation



- ❑ Camera/printer setting
 - ✧ In the **Camera** subtask card, select a different camera/printer or film size, if necessary:
 - (1) Select the camera if several cameras are configured
 - (2) Display of the film job status, e.g. "queued", "printed" etc.
 - (3) Select one of the film formats available in the camera
- ❑ Zoom/Pan
 - ✧ Activate the function by clicking the corresponding button (4).
 - ✧ Zoom/pan the image with the left mouse button pressed.
Mouse at image edge: change image size
Mouse in image center: pan image
 - ✧ If required, reset the image to the original position and -size (5).

Printing a film job from the Filming task card

- ✧ Set the number of copies (standard = 1 copy) (6).
- ✧ If necessary, delete individual images from the film sheet (7).
- ✧ Send the film job to the camera manually (8) or activate automatic exposure (9).
- ✧ If necessary, check the processing of the film job (10).
- The status ("queued", "printed" etc.) of all film jobs of the selected camera is shown.

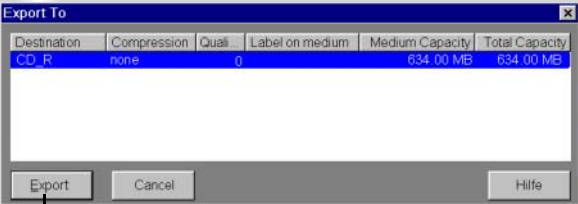
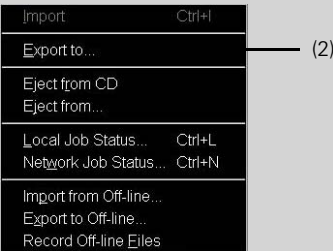
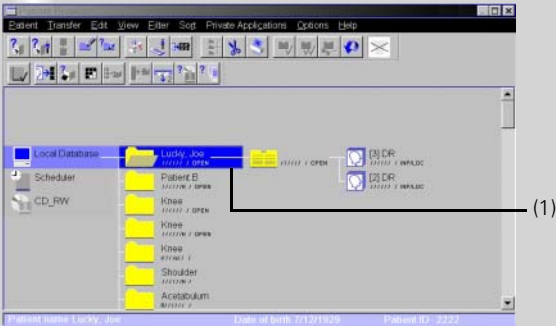
Documentation



Only non-rewritable CDs, (CD-Rs), can be used. Rewritable CDs (CD-RWs) are not accepted.



The DICOM viewer is started directly from the CD; no files are installed on the computer.



Burning CDs

As your system is configured for multi-session, you can store your data to unrecorded CD-Rs, or CD-Rs that have already been written to. The new data is added to the old data on the CD-R.

❑ DICOM Viewer

In the first session, a DICOM viewer is written to the CD together with the image data. This allows you to view the images stored on the CD on any computer.

Exporting workflow

- ✧ Click the patient(s) in the **Patient Browser** (1).

- ✧ In the menu bar of the **Patient Browser**, click **Transfer > Export to...** (2).
- ➡ The dialog window for data export is opened.

- ✧ Select the CD-R as the target and click **Export** (1).
- ➡ The export process starts. The CD is automatically labeled with the date and time.

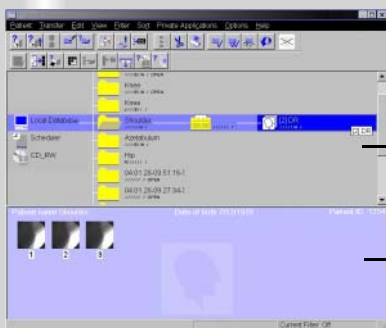
Reports



The prerequisite for both report types is the registration and examination of a patient. In addition, for a LithoReport, the lithotripsy function must be enabled on your system and connected to the imaging system.



The radiation summary report is generated automatically based on the present examination data. It cannot be postprocessed.



(1)



(2)



(3)

Generating reports

If the reporting function is enabled on your system, important examination data are automatically compiled into a structured report for documentation and treatment purposes.

Report types

- ❑ Radiation summary report
contains the accumulated values of the examination for the number of exposures, fluoroscopy time and dose area product
- ❑ LithoReport
contains the data on the diagnosis, treatment and postprocessing of an extracorporeal shockwave lithotripsy (ESWL) procedure

Using reports

You can read, print and send the reports and complete the automatically entered data in the LithoReport.

Managing reports

Reports are stored and managed in the **Patient Browser** as additional data objects in 2 formats. They can be selected via the relevant icons like examination images:

- (1) Report icon in the navigation area
- (2) Report icon in the content area
Format: Structured Report (SR)
To open the Report Editor
- (3) Report icon in the content area
Format: Secondary Capture (SC)
Loading e.g. into Viewing possible;
PACS-compatible

Reports



A lithotripsy procedure is possible only after a patient has been registered.



When you start an ESWL treatment, the LithoReport editor is opened automatically with the new report.



In the **Viewing** task card you can open reports by clicking the relevant button on the **Reporting** subtask card.



Miller (Id: 1234567), Acc. num.: n.a., Report Id: 6001, Ver. 1 - Litho-Report Editor

(1) [Icon]

(2) **LithoReport**
EXAMINATION REPORT

PATIENT

Patient / Diagnosis

Date of treatment: 11/24/2004
Accession Nr.:
Pat-ID: 1234567
Name: Miller
First name: Arthur
Date of birth: 11/1911 Age: 88 Y
Sex: male * female
Weight: kg
Height: cm

INSTITUTION

Institution:
City:
Street:
Country:
Phone: 56789

Ambulant / Ward: Ambulant
Performing physician: Physician 1
Assistance: Assistant 1
Anesthetist: Anesthetist 1

DIAGNOSIS

Diagnosis:
- Ultrasound
- KUB / img without contr. med.
- IVP
- X-Ray
- Ultrasound
Localization with:
Urinary obstruction: None
First treatment/ Re-treatment: Treatment 1

R L

Primary stone location:
Stone size: 3.5 mm
Multiple stones:

(3) [Diagram of kidneys and ureters showing stone location]

(4) [Buttons: OK, Apply, Cancel]



In the STATUS area you can see the current processing and verification status. You can change these statuses only in the case of postprocessing reports (according to the work progress made).

Editing a LithoReport

Unlike in the case of the radiation summary report, you can enter or subsequently change part of the LithoReport data yourself.

Opening a report

- ✧ Select the required LithoReport in the **Patient Browser** and select **Reporting > Open report**.
- ✧ Select the required report in the dialog window displayed.

LithoReport editor

The selected report is displayed in the LithoReport editor.

- (1) Icon buttons for printing a report
- (2) Display of report status
 - Examination report (treatment in process)
 - Postprocessing report (treatment finished)
- (3) Open card
- (4) Button bar

Reports



During an examination the LithoReport editor is automatically in edit mode.

Edit

(1)

Apply

(2)



To close the LithoReport editor, click **OK**.



With this button in the LithoReport editor you can call up the print preview of the report.



(3)

Print Report [X]

Printer	Sony LPR-1000MD	▼
Papersize	A4	▼
Layout	Standard	▼

OK Cancel

(4)

Completing and changing data

To modify data, you need to change into edit mode. This is, however, not possible if the report has already been completed (status “completed”).

- ✧ Click **Edit** (1).
- ✧ Make your changes in the **Patient/ Diagnosis, Therapy, Summary, Postprocessing** cards.
- ✧ To accept your changes, click **Apply**.
- The LithoReport editor remains open.

Printing and exporting a report

A report can be exported only if it has reached the status “completed” and “verified.”

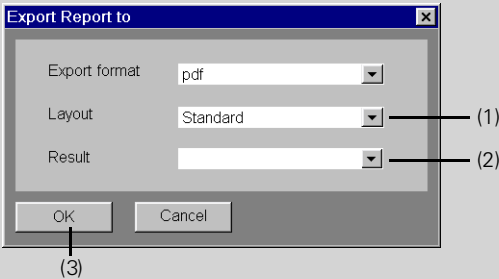
Printing

- ✧ Click this button in the LithoReport editor (3).
- The **Print Report** dialog window is opened (4).
- ✧ If necessary, change the print settings.
- ✧ Confirm with **OK**.
- The report is printed.

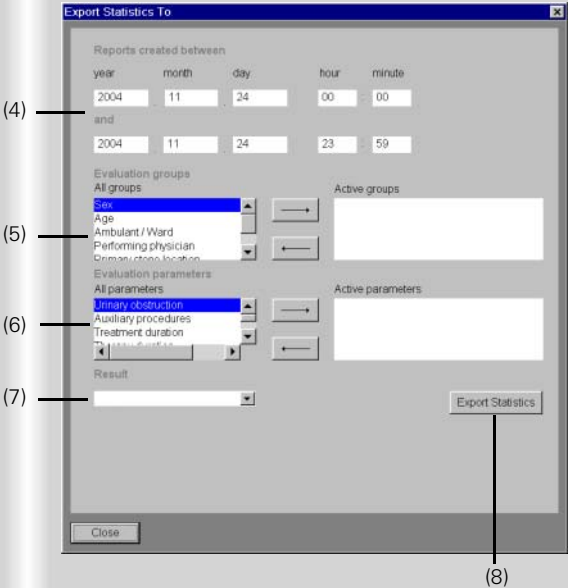
Reports



Files in pdf format can be read and printed on other computers with the Acrobat Reader freeware program.



The program compiles all reports from the local database that meet your specified criteria.



Exporting a report as pdf file

The report is saved as a pdf file in the CDR_OFFLINE directory. From there you can write the file to CD.

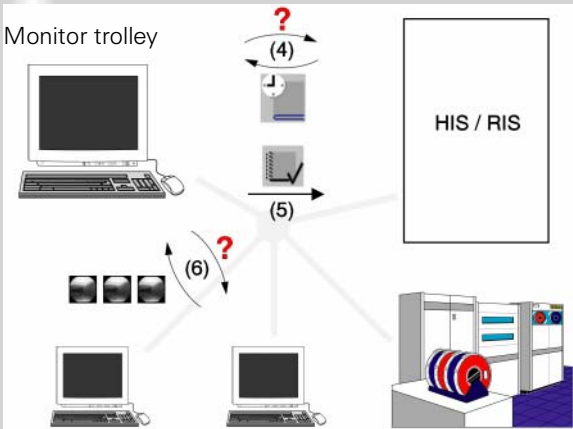
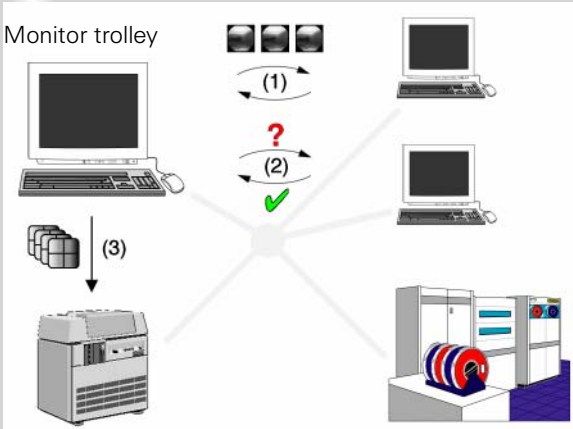
- ✧ Select the required report in the **Patient Browser** and call up **Reporting > Export Report to....**
- ✧ Select a suitable layout for the pdf file in the dialog window displayed (1).
- ✧ Enter a name for the pdf file in the **Result** field (2).
- ✧ Confirm with **OK** (3).

Exporting for statistical evaluations

Data from LithoReports can be exported in ASCII format. This text file is saved in the CDR_OFFLINE directory.

A report can be exported only if it has reached the status "completed" and "verified."

- ✧ Select the required report in the **Patient Browser** and call up **Reporting > Export Statistics To....**
- ✧ Enter your filter criteria in the three areas:
 - (4) Reports created between (period of time)
 - (5) Evaluation groups
 - (6) Evaluation parameters
- ✧ In the **Result** field, enter a name (ending in ".txt") for the export file (7).
- ✧ To start the export, click the **Export Statistics** button (8).



ARCADIS can optionally be connected to a network. The following two variants are available:

DICOM System Basic

Send/Receive + Storage Commitment, Print

- (1) Send/Receive
Sending and receiving of patient images
- (2) Storage Commitment
Requesting a confirmation that images have been securely stored after sending
- (3) Print
Printing of patient images on X-ray films via a network
→ Page 93

DICOM System Advanced

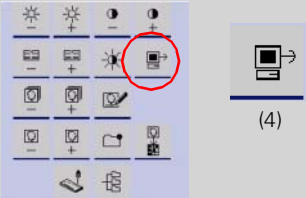
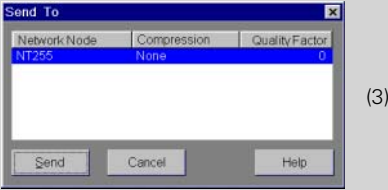
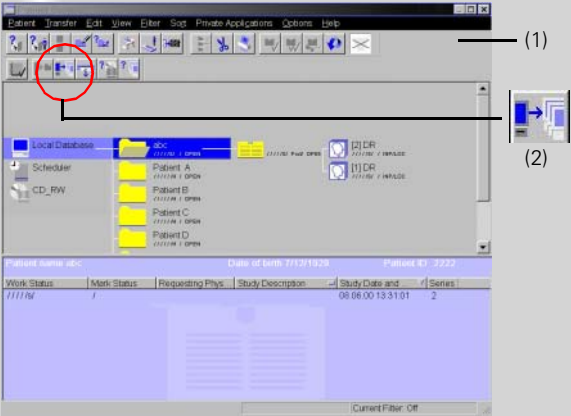
(in addition to the above-named functions)

- (4) Worklist
Querying the worklist (all patients for a system) and loading the patient data
- (5) MPPS = Modality Performed Procedure Step
Feedback to an information system about the status of a work process
- (6) Query/Retrieve
Searching for images in the network (incl. other modalities), importing of images into the local database

Connectivity



You can also receive images from another system (CT, MR etc.) or workstation. For this, the images have to be actively sent from this system or workstation to ARCADIS.



Send/Storage Commitment

The **Send to** function allows you to archive patient images in an information system or to send them to another workstation for post-processing.

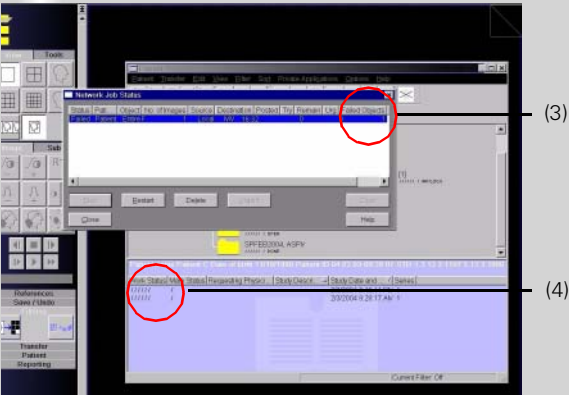
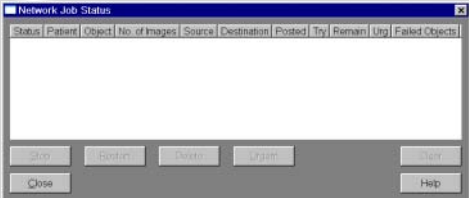
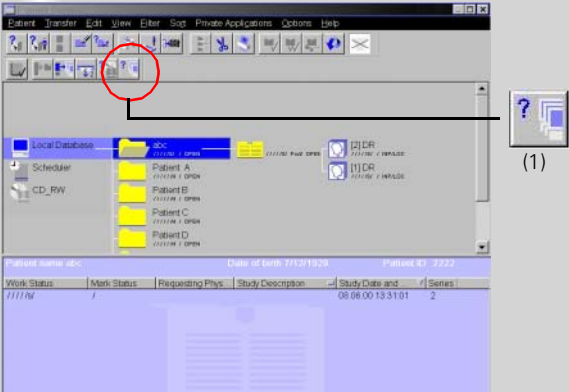
Send to

- ✧ Open the **Patient Browser** (1).
- ✧ Select the patient (or individual examinations) whose data you want to send.
- ✧ Click the **Send to...** button (2).
- ✧ Select the network node (recipient) and confirm with **Send** (3).
- ✧ The images are sent to the selected address (information system or workstation).

Sending to a standard address

- ✧ Press the **Send** key on the keyboard of the monitor trolley (4).
- ✧ The selected patient images are sent to the first "standard" node configured by Siemens Service.

Connectivity



Tracking network processes

- ✧ Click the **Network Status** button (1).

- ✧ Current processes in the network are shown (2).

Storage Commitment

If patient data are sent or archived in an information system, the **Storage Commitment** function requests a confirmation from the receiving station that images have been securely stored:

(3) Column for error messages

(4) Feedback in the status bar
("SV" = sent and verified)

- ✧ In the case of an error message, the data in the **Patient Browser** must not yet be deleted, because they have not yet been properly saved or archived.
- ✧ Repeat the process again.

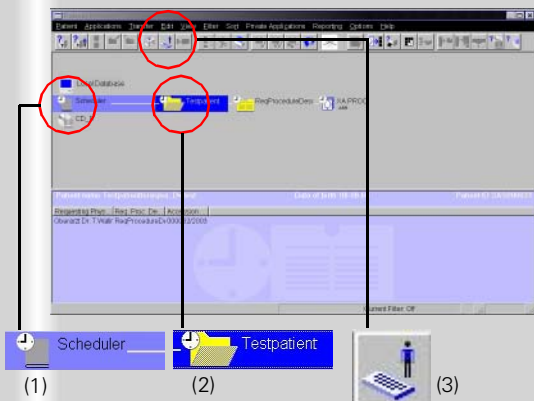


Get Worklist offers the advantage of a simplified workflow:

In an information system the OR plan (i.e. which patients are planned for a certain operating room or C-arm) can be prepared the day before and retrieved in the OR.

Patients can then be retrieved quickly just before the procedure and the data can be transferred to the **Examination** task card. Patients no longer need to be registered manually.

The **Get Worklist** function also prevents the entry of incorrect patient data, since the data do not need to be entered manually.

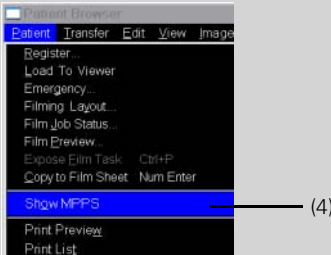
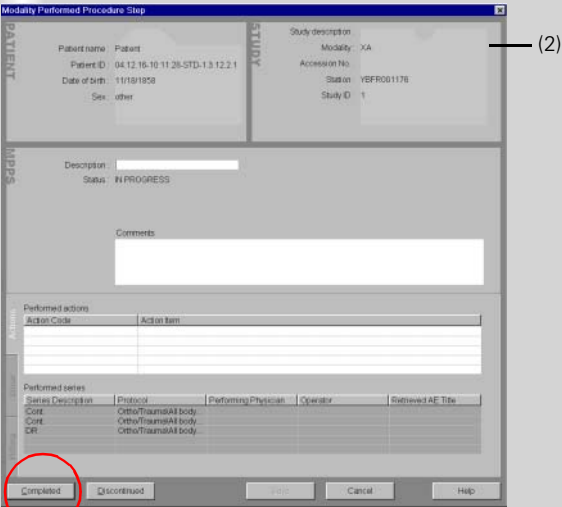
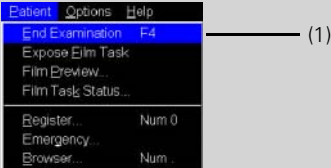


To update the worklist again, initiate a new request to the information system by double-clicking on the Scheduler.

Get Worklist

The **Get Worklist** function contains a request for a worklist within an information system.

- ✧ Double-click the **Scheduler** in the **Patient Browser** (1).
- A worklist with patients whose data are present in XA format (data format for conventional radiography) appears.
- ✧ Select the patient to be examined in the **Scheduler** (2).
- ✧ Click the **Patient Registration** button (3).
- The **Patient Registration** window opens. The data of the selected patient have already been entered.
- ✧ Click **Exam** in the **Patient Registration** window (4).
- The data are transferred to the **Examination** task card, and the examination can be started.



MPPS – Modality Performed Procedure Step

MPPS (Modality Performed Procedure Step) is a confirmation to an information system that a certain process (in this case the examination of a patient) has been completed.

Calling up MPPS after an examination

- ✧ Select **Patient > End Examination** in the **Examination** task card (1).
- The MPPS dialog is displayed (2).
- ✧ If desired, enter information and comments on the procedure (e.g. unusual occurrences, complications).
- ✧ To end the dialog, click **Completed** (3).
- The OR documentation is sent to the information system, where it is archived.
- The patient is deleted in the Scheduler.

Calling up MPPS manually

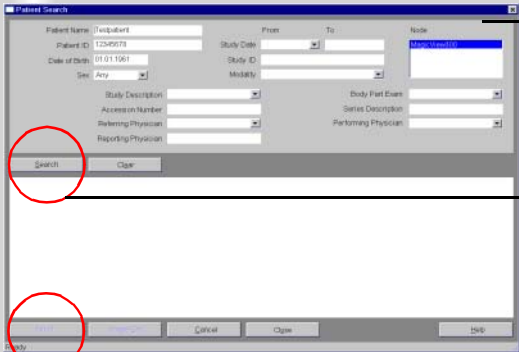
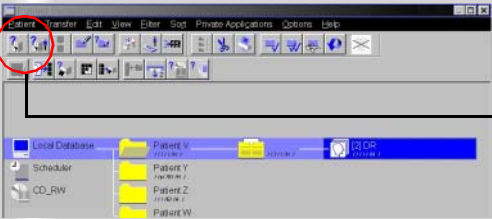
If you have accidentally closed the patient by registering a new patient, you can open the MPPS dialog manually.

- ✧ Select **Patient > Show MPPS** in the menu bar of the **Patient Browser** (4).

Connectivity



The *Retrieve* function is important above all for preoperative images that are needed for virtually any procedure.



(2)

(3)

(4)

Query/Retrieve

❑ Query

A query to an information system can be started. If the patient is already known to the information system, the existing images are displayed.

❑ Retrieve

Images can be imported into the local database and loaded into the **Viewing** task card.

✧ Click the **Search** button in the **Patient Browser** (1).

➤ The search dialog opens (2).

✧ Enter the known patient data (unknown data can be replaced by the * wildcard, e.g. A*).

✧ Start the search by clicking **Search** (3).

➤ The patient images present in the information system are displayed.

✧ Click the **Import** button (4).

➤ The patient images are imported into the local database from where they can be loaded into the **Viewing** task card.



Communication is implemented either directly between the C-arm and the navigation system or through a hospital network. In the first case, the network cable from the C-arm is connected directly to the navigation system. In the second case it is plugged into the network socket in the OR room.



In connection with the NaviLink 3D option, the calibration of the system should be checked at least every six months together with the navigation system used. If necessary, a new calibration must be performed.

Features

NaviLink 2D is a newly developed interface that enables the communication of 2D image data between ARCADIS Orbic and a navigation system.

With the exception of the connection of the C-arm to the navigation system via the network cable and the generation of images for navigation, the entire workflow takes place at the navigation system.

NaviLink 3D is an interface to optical navigation systems for automatic registration of the 3D data set.

Via NaviLink 3D the navigation system registers the start position of the C-arm and receives the 3D data set (cube) at the end of the scan.

(1)



Digital Radiography must be selected as operating mode. The navigation system does not accept images of other operating modes.



Confirmation is required only if the image is to be used for navigation. All other images are only stored in the **Patient Browser** at the monitor trolley.



In general, 2 images are required.



All other work steps are performed at the navigation system. The C-arm is still used for postoperative follow-up exposures, for example. In very small operating rooms, however, it is often dismantled and taken out of the room.

Procedure

Preparation

- ✧ Set up the C-arm and the navigation system and start both systems.
- ✧ Enter the patient data.
- ✧ Establish direct communication with the aid of a network cable.
- The readiness of the C-arm is indicated by an icon in the status bar of the **Examination** task card (1).
- ✧ Select the examination parameters.

Procedure

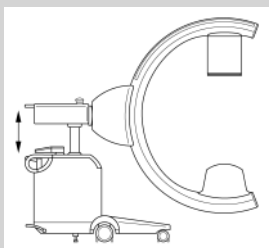
- ✧ Release radiation.
- The image appears in the **References** task card at the monitor trolley.
- ✧ Check the setting and image quality. If necessary, repeat the exposure.
- ✧ Confirm the selection of the image at the navigation system by clicking **Request image**.
- The image is automatically transferred from the C-arm to the navigation system.
- ✧ Make further exposures until you have reached the desired number of images for navigation.

Final steps

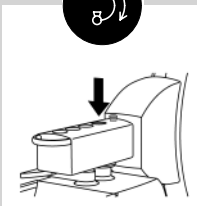
- ✧ If necessary, dismantle the C-arm and take it out of the room.

Dismantling

(1)



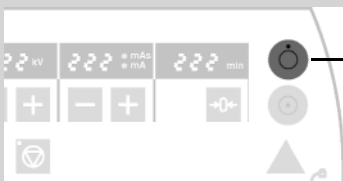
(2)



The C-arm can only be moved while it is switched on.



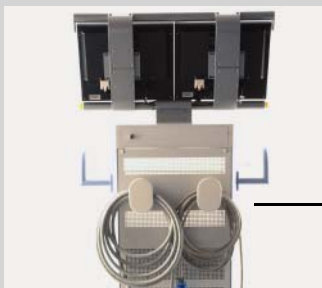
(3)



(4)



To define the switch-on duration yourself, you can perform a full shut-down manually. To do so, select **Options > End session** in the main menu before turning the system off.



(5)

Transport position

The C-arm system should be transported and parked in a zero position.

- ✧ Lower the lifting column fully (1).
- ✧ Move the C-arm into an a.p. position (2).

Switching off

- ✧ Switch the unit off at the monitor trolley or the C-arm system:

(3) Switching off at the monitor trolley

(4) Switching off at the C-arm system

- ✧ The image system is shut down and switched off in the "hibernate" status. Switching the system back on takes approx. 45 secs. until it is fully operational.
- ✧ The 13th time the system is switched off, it is automatically completely shut down. Then switching the system back on takes approx. 3 mins. until it is fully operational.
- ✧ Disconnect the monitor trolley from the C-arm system.
- ✧ Roll up the cables at the rear of the monitor trolley (5).
- ✧ The C-arm system is ready for transport.

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